

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[The MINING JOURNAL is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.]

No. 2530.—VOL. LIV.

LONDON, SATURDAY, FEBRUARY 16, 1884.

WITH
SUPPLEMENT.] PRICE SIXPENCE
BY POST, 2½d. PER ANNUM

M R. JAMES H. CROFTS, STOCK AND SHARE DEALER,
NO. 1, FINCH LANE, CORNHILL, LONDON, E.C.
ESTABLISHED 1842.

BUSINESS transacted in all descriptions of MINING Stocks and Shares (British and Foreign), Consols, Banks, Bonds (Foreign and Colonial), Railways, Insurance, Assurance, Telegraph, Tramway, Shipping, Canal, Gas, Water, and Dock Shares, and all Miscellaneous Shares.

BUSINESS negotiated in Stocks and Shares not having a general market value.

Every Friday a general and reliable List issued (a copy of which will be forwarded on application), containing closing prices of the week.

MINES IMPORTED.

BANKERS: CITY BANK, LONDON—SOUTH CORNWALL BANK, ST. AUSTELL.
TELEPHONE NUMBER 1003.

SPECIAL DEALINGS in the following, or part:—

100 Asia Minor.	100 Guineas Coast Gold.	20 Panucillo.
60 Akankoo, fully paid.	10 Great Laxey.	100 Prince of Wales.
50 ditto, 17s. 6d. paid.	20 Gunnislake (Clitters).	50 Potosi.
50 Almada.	50 Hawkin's Hill.	20 Rio Tinto.
25 Bedford United.	50 Kingston Down.	75 Ruby.
Bratsberg.	200 Hoover Hill.	30 Rhodes Reef.
25 Bwlch United.	100 Home Mines Trust.	25 Richmond.
40 Cankin Bamboo.	50 Honey & Trelawny.	20 Roman Gravels.
50 Carn Camborne.	200 Indian Consolidated.	20 South Caradon.
50 Callao Bis.	100 Indian Glenrock.	15 South Cadourrow.
50 Chile Gold.	100 Javall.	50 South Darren.
100 Colombian Hydraulic.	100 Kapanga.	100 South East Wynaad.
50 Consolidated.	50 Killifret.	50 South Devon United.
50 California.	50 La Plata (New).	300 Sortridge (offer wtd.)
50 Colorado.	50 Last Chance.	30 South Penstruthal.
30 Canada Copper.	20 Leadhills.	50 Tambraberry.
50 Chontales.	50 Lisson-Berlyn.	200 Tanker. Gt. Consols.
25 Cor. So. Austra. Cop.	80 Marke Valley.	20 Tolima A.
75 Denver.	50 Michipicoten.	30 ditto B.
50 Devala Moyer.	15 Mona.	100 Treavean.
Devon Consols.	100 Mounts Bay.	25 Trevauanance.
Devon Friendship.	200 Mysoe Gold.	25 United Mexican.
50 Devon United.	100 New Caradon.	50 Victoria Gold.
10 Dolcoath.	50 New Callao.	20 Van.
20 Don Pedro.	50 New Emma.	100 Wheal Bassett.
50 Drakewells.	25 New Quebrada.	25 West Callao.
50 Duchi Peru.	50 North Blue Hills.	50 West Phoenix.
50 East Blue Hills.	200 Nouveau Monde.	200 West Caradon.
50 Eberhardt.	200 Nuevo Monde.	50 West Oreb.
50 East Caradon.	200 North Penstruthal.	25 West Polbreen.
50 East Craven Moor.	25 Old West Caradon.	10 West Kitty.
50 East Lovell.	100 Old Shepherds.	50 West Poldice.
100 East Wheal Rose.	100 Organos.	50 Wheal Coates.
50 Eton.	75 Orta.	25 Wheal Oreb.
50 Flagstaff.	25 Polrose.	75 Wheal Jane.
50 Frongoch.	50 Penhalls.	55 Wheal Kitty.
50 Frontino.	100 Potosi.	25 Wheal Silver & Lanteglos.
50 Goginan.	80 Port Phillip.	200 Wynaad Perseverance.
100 Gold Coast.	150 Parys Copper.	100 Wynaad Perseverance.
50 Grogwinion.	25 Phoenix United.	
** SHARES SOLD FOR FORWARD DELIVERY (ONE, TWO, OR THREE MONTHS) ON DEPOSIT OF TWENTY PER CENT.		
** SPECIAL BUSINESS AT CLOSE PRICES in all Market TIN, COPPER and LEAD SHARES.		
JAMES H. CROFTS, 1, FINCH LANE, LONDON.		

RAILWAYS — SPECIAL BUSINESS.—Fortnightly Accounts opened on receipt of the usual cover.

JAMES H. CROFTS, 1, FINCH LANE, LONDON.

FOREIGN BONDS — SPECIAL BUSINESS.—Fortnightly Accounts opened on receipt of the usual cover.

JAMES H. CROFTS, 1, FINCH LANE, LONDON.

AMERICAN AND CANADIAN STOCKS AND SHARES — SPECIAL BUSINESS.

Fortnightly Account opened on receipt of the usual cover.

JAMES H. CROFTS, 1, FINCH LANE, LONDON.

GOLD AND SILVER MINES.—SPECIAL BUSINESS in ALL marketable INDIAN GOLD SHARES, and in California, Callao "Bis," Gold Coast, Guineas Gold Coast, Lisbon-Berlyn, New Callao, West Callao, Tolima A, Tolima B, La Plata, Rio Tinto, Frontino and Bolivia, Potosi, Chile, Nouveau Monde, Ruby, Richmond, Victoria.

** SHARES IN THE ABOVE SOLD FOR FORWARD DELIVERY ONE, TWO, OR THREE MONTHS ON DEPOSIT OF TWENTY PER CENT.

JAMES H. CROFTS, 1, FINCH LANE, LONDON.

ELECTRIC LIGHT SHARES — SPECIAL BUSINESS.

Anglo-American Hammond, Swan.

Shares sold for cash, account, or for forward delivery (one, two, or three months) on deposit of 20 per cent.

JAMES H. CROFTS, 1, FINCH LANE, LONDON.

FAST WHEAL ROSE, OLD SHEPHERDS, MOUNTS BAY, TRESAVEAN, HOME MINES TRUST, DUCHY PERU.

SPECIAL BUSINESS in the above for cash or account.

For SPECIAL SALE for FORWARD DELIVERY ONE, TWO, OR THREE MONTHS, subject to deposit of TWENTY PER CENT., 100 Duchi Peru, 200 East Wheal Rose, 200 Old Shepherds, 200 Tresavean, 300 Mounts Bay.

JAMES H. CROFTS, 1, FINCH LANE, LONDON.

ESTABLISHED 1842.

M R. W. H. BUMFUS, STOCK AND SHARE BROKER, AND MINING SHARE DEALER, 44, THREADNEEDLE STREET, LONDON, E.C.

ESTABLISHED 1867.

BUSINESS transacted in STOCK EXCHANGE SECURITIES and MISCELLANEOUS SHARES of every description.

RAILWAYS, BANKS, FOREIGN and COLONIAL BONDS.

TRAMWAYS, TELEGRAPHs, and all the LEADING INVESTMENTS.

Accounts opened for the Fortnightly Settlement.

A List of Investments free on application.

M R. BUMFUS has SPECIAL BUSINESS in the undermentioned:—

75 Almada.

50 Asia Minor.

25 Birdseye Creek.

50 Bratsberg.

25 Bedford United.

20 Carn Camborne.

20 Carn Brea.

200 Chontales.

100 Colombian.

100 Chile Gold.

40 Colorado.

100 California Gold.

15 Copiapo.

150 Callao Bis.

5 Cook's Kitchen.

3 Dolcoath.

60 Devon Friendship.

35 Drakewells.

20 Devon Consols.

35 New Kitty.

50 Duchy Peru.

200 Nouveau Monde.

100 East Wheal Rose.

50 East Lovell.

50 Eton.

50 Frongoch.

50 Frontino.

50 Goginan.

100 Gold Coast.

50 Grogwinion.

** Prices of the above on application, or offers may be made. Several o's of shares in this list are for sale under market quotations.

SPECIAL BUSINESS at close prices in the SHARES of all the principal HOME and FOREIGN MINES.

Mr. BUMFUS devotes special attention to these Securities, and is in a position to afford reliable information and advice to intending Investors and others.

WILLIAM HENRY BUMFUS, SWORN BROKER,

OFFICES: 44, THREADNEEDLE STREET, LONDON, E.C.

ESTABLISHED 1867.

BRITISH AND FOREIGN MINING OFFICES.

M E S S R S . P E T E R W A T S O N A N D C O . ,
18, A U S T I N F R I A R S ,
O L D B R O A D S T R E E T , L O N D O N , E.C.

BANKERS: THE ALLIANCE BANK (Limited).

M E S S R S . P E T E R W A T S O N A N D C O . ' S
B R I T I S H A N D F O R E I G N M O N T H L Y M I N I N G N E W S
—STOCK AND SHARE INVESTMENT NOTES—MINES,
M I N E R A L S , A N D M E T A L M A R K E T S —SH A R E L I S T ,
N O . 862, V O L . X V I I , f o r F E B R U A R Y month, is ready, and will be sent to customers on application.

Annual Subscription..... 5s. | Single Copy..... 6d.

The Title Page and Index to our Eighteenth Volume are now ready, and can be obtained on application.

M R . A L F R E D E . C O O K E ,
STOCK AND SHARE DEALER,
9, O L D B R O A D S T R E E T , L O N D O N .

ESTABLISHED 1853.

M R . A L F R E D E . C O O K E c a n SELL the following shares, or portions thereof, at LOWEST CURRENT MARKET QUOTATIONS FREE of COMMISSION.

30 Bratsberg Copper. 50 Mounts Bay. 30 South Kitty Tin.

30 Callao Bis Gold. 50 New West Caradon. 20 South Darren Silver-Gold.

30 Colombian Hydraulic. 50 Potosi Gold. 10 South Cadourrow Copper.

30 Cornishman. 50 Nuevo Monde Gold. 15 Trevauanance.

30 Curn Camborne. 50 North Blue Hills. 50 Tresavean Copper & Lead.

30 Chontales Gold. 50 Old Shepherds. 10 Tolima A.

30 Corporation of South Australia Copper. 40 Organos. 20 Untd. Mexican Silver.

30 Cartago Gold. 50 Orita Gold. 65 Victoria Gold.

30 Devon Friendship. 50 Prince of Wales. 20 Western Andes.

30 Dolcoath Tin. 50 Potosi Gold. 150 West Callao Gold.

30 East Rose. 50 Port Phillip Gold. 50 West Caradon Copper.

30 Frongoch. 60 Parys Copper. 20 West Polbreen Tin.

30 Frontino. 50 Richmond Silver. 50 West Gonamena Cop.

30 Goginan. 50 Home Mines Trust. 10 Roman Gravels Lead.

30 Great Laxey. 50 La Plata Lead. 50 Ruby.

30 Great Laxey. 50 Leadhills. 100 Wheal Jane Tin.

30 Great Laxey. 50 Mounts Bay. 20 Wheal Crebor Copper.

30 Great Laxey. 50 New Emma. 100 Yorke Preference.

30 Great Laxey. 50 New West Caradon. 60 West Callao.

30 Great Laxey. 50 Old Shepherds. 60 West Oreb.

30 Great Laxey. 50 Old Shepherds. 20 West Kitty.

30 Great Laxey. 50 Orita. 40 West Polbreen.

30 Great Laxey. 50 Organos. 25 Wheal Oreb.

30 Great Laxey. 50 Potosi. 100 Wheal Phoenix.

30 Great Laxey. 50 Prince of Wales. 100 Wheal Phoenix.

30 Great Laxey. 50 Potosi. 100 Wheal Phoenix.

30 Great Laxey. 50 Prince of Wales. 100 Wheal Phoenix.

30 Great Laxey. 50 Prince of Wales. 100 Wheal Phoenix.

30 Great Laxey. 50 Prince of Wales. 100 Whe

MINING PROGRESS IN CANADA.

Although as compared with other dependencies of the British Crown capitalists have given very little assistance to Canada there can be no question that every province of the Dominion possesses mineral resources which are well worth their attention. With regard to the Eastern provinces it is stated that there is an abundance of good iron ore, hematite, on the Cobequid Mountains at Acadia Mines, Nova Scotia, where the Canada Steel Company has located works giving employment to 500 men. The output of ore last year was 50,000 tons, which was made into pig and bar iron, car wheels, &c., valued at over \$600,000. Iron ore is found in other localities, but not to any such extent as here. The largest colliery in Canada is at Spring Hill Mines, N.S., where about 500 men are employed, and the output last year amounted to 200,300 tons of coal, or nearly one-sixth of the entire production of Nova Scotia. At Stellarton, N.S., 141,000 tons of coal were raised last year, and 12,612 tons of coke manufactured. At Sydney, Cape Breton, the coal fields underlie over 200 square miles, the greater part of which is under the Atlantic Mining rights covering over one-half of this submarine coal have been taken out. The Sydney Mines give employment to about 15,000 men, and coal is seen, smelt, and felt everywhere. At Pictou, N.S., coal has been exported since 1798, though the amount was small till 1829. It is now the principal business of the port. At Bridgeport, C.B., the International Coal Mines give employment to 300 men and boys, and the output for last year was 109,286 tons. At the Joggins Mines, N.S., an attempt has been made to obtain railway facilities from MacCann on the Intercolonial Railway, so that the coal now mined there may find a more ready market. The famous Albertite coal that was obtained from the Albert Mines, New Brunswick, for several years has become exhausted, and mining has been discontinued.

The Nova Scotian gold mines appear to be yielding excellent returns, considering the small amount of money and labour that is being expended upon them. At Mount Uniacke there are three gold mines and four quartz mills; 3440 tons of quartz were crushed, furnishing 9128 days' employment, and yielding \$3.52 per day per man. This was the best return of any mine in the province. At Sherbrooke the ore is low grade, but easily worked, and distributed in large quantities over an area of 18 square miles. The yield of six quartz mills last year was 2572 ozs. 17 dwt. 14 grs. At Goldenville, three miles from Sherbrooke, \$500 was found the day the mines were discovered in 1861, and there has been a yield of \$2000 per man, per year, during some years. At Tangier the yield last year was 789 ozs. from 1622 tons of ore. At Waverly the yield was 234 ozs. 7 dwt. 5 grs., from 554 tons of ore, three mines having been worked and 2238 days' labour performed. At Wine Harbour the ore is easily worked, but poor, yielding only 94 cents per day per man. At Country Harbour 903 ozs. were obtained last year from 511 tons of quartz, and the Oxford Gold Mining Company, of Chezzetcook, obtained \$6300 from 130 tons of ore worked during 12 days in May, 1882.

At present the reciprocity movement for securing a treaty between Canada and United States for the mutual removal of duties on coal and iron ore. The miners engaged in raising those products are naturally delighted, but the feeling in favour of such a treaty is by no means universal; many see that the result would be to add to the manufacturing power of the United States without conferring any corresponding benefit upon either Canada or England. The Reciprocity Association has quite recently held a meeting in America when Mr. E. N. Fribbie was appointed President; Mr. W. C. Andrews, treasurer; and Mr. C. J. Pusey, secretary. Representatives were present of the coal and iron interests of Cleveland, Youngstown, Toledo, and other points. A committee was appointed which, with one from the Board of Trade of Montreal, went to Ottawa, and on Saturday last held a conference with Sir Leonard Tilley, Minister of Finance, and the Hon. Mr. Bowell, Minister of Customs. In their report to the association at the meeting the committee stated that it found the Canadian ministers anxious to have lumber and salt included in the proposed treaty, but the New York committee was not prepared to give them any encouragement on that point. The committee had every reason to believe that the Dominion Government was very favourably disposed to the proposed treaty, and that if Congress should place Canadian iron ore and coal on the free list, the Dominion Cabinet would exercise the power vested in it and place the same products of the United States on a similar list. A committee headed by the Hon. Galusha A. Grow was appointed to press the matter of a treaty at Washington. A wrong impression, says the New York Engineering and Mining Journal, is abroad that this movement originated in Canada. It had its origin in the United States. The fact that a delegation from the Montreal Board of Trade accompanied the American committee to Ottawa may explain the mistaken impression. It is proposed to ask the present Congress to pass an act allowing Canadian coal and iron ore to be entered free of duty, provided that the Canadian Parliament will also pass a similar act in regard to American iron ore and coal. Efforts will be made to urge immediate action on the part of Congress, and several Congressman pledged to support the movement at the proper time. Should such legislation be obtained as desired, both in the States and in Canada, the greatest benefit will be to the States, for Canada will be giving up revenue to the amount of about \$1,000,000, whilst the United States will have to give up only about \$250,000 in revenues, but if Canada gives up much more at first than the United States does Canada looks forward to the development of her iron mines, whose ores are specially adapted to making Bessemer steel, and in the long run the advantages will undoubtedly balance.

The producers of bituminous coal in Northwestern Pennsylvania, who seek a market in and through Buffalo and Rochester, held a meeting yesterday at the Victoria Hotel, to consider the annual production and to consult with the agents of the railroads leading to those points, as to freight rates on their product during the year and as to the general interest of the bituminous coal trade. The representatives of the principal companies were present and ultimately, Messrs. Galusha A. Grow was elected Chairman, and A. Dowdell, secretary. A committee was appointed to report on the annual production of bituminous coal for the Buffalo and Rochester markets and the best method to regulate the output. The following resolution was unanimously adopted, on the motion of E. N. Fribbie:—It was resolved—"That we are in favour of reciprocity with Canada on coal and iron ore, and we heartily approve the efforts making by the 'Association for Reciprocity on Coal and Iron ore' to secure the necessary action by the Governments of the United States and Canada to obtain such a result." The committee on coal production reported in favour appointing a committee representing the railroads and the producers of bituminous coal which should have power to regulate the annual production.

The nature of the phosphate deposits and the question, Will Deep Mining Pay? are ably discussed by Mr. Henry G. Vennor, F.G.S., in the last number of the Canadian Mining Review. He states "that in the present active state of phosphate mining and general enquiry concerning our mines, it will be of interest to consider briefly the conditions of the deposits, and more particularly what evidence there is of these being deep-seated. I have elsewhere stated—and oftener than once—that the apatite rocks were, geologically considered, superficial. Hence the query naturally arises, Will Deep Mining Pay?" This question is an important one at the present time when so much capital is being invested in mines and mining properties, but, in so far as I have seen, no answer of a satisfactory nature has yet been given. The question, however, is a simple one, when we look into the nature of the deposits—i.e., their geological conditions. The miner, who hitherto has been at work at economic ores in true fissure veins cutting alike all the rocks of a particular mining district, is entirely at sea when he is placed in the phosphate field. He may talk as he pleases about being on or off the main lode, but of one thing only is he really certain and that is of being supremely puzzled. Tell him to search in the direction of the bedding and he will laugh you to scorn and inform you that true veins but rarely run so. Yet, such is the truth—the very truth—in the case of phosphate deposits. These are nothing more than a series of irregular (large and small) masses distributed along one or two plains of bedding in one particular belt of rock. Leave this particular belt and you lose your phosphate; follow it and you continue to discover new deposits. This is only natural, of course, and is the case with iron ore and similar deposits, true veins occur as spurs or infiltrations

from these embedded masses, but only run for very limited distances. The very finding, however, of one or two of such veins is enough for the embryo mineralogist and geologist, and he hastens to set it down as an established fact.

Many British capitalists being interested in Lake Superior mines it is gratifying to find that fair progress is being made. The Canadian Mining Review states that at Silver Islet about 50 miners are employed, a depth of 1200 ft. has been reached, and on the 1160 ft. level they are drifting both ways. The mine is said to be yielding silver in paying quantities. This company owns a large tract of land on the main shore at Mamainse, which has been successfully prospected, and native copper, yellow and gray copper ores in veins have been discovered, as well as native silver, said to be very rich. On the property adjoining this last mentioned location, the Lake Superior Native Copper Company are expending about \$12,000 per month, and employ 175 men. A shaft has been sunk 200 ft., and in one of three levels they have drifted 600 ft. The ore at the depth obtained carries about 3 per cent. of metal. The Michipicoten Native Copper Company are doing good work at their mine, to the north-west of the Lake Superior Native Copper Company's property, and it is said they have struck ore rich in native copper. Both of these mines are being worked by English capital. Within 25 miles of Port Arthur the Rabbit Mountain Silver Mine is located, and of this property much has already been read in the Canadian press. Nuggets of black silver, weighing as much as 12 lbs. each, have been taken from the vein, through which silver appears well disseminated. The vein is unquestionably a large one, and a large quantity of silver is in sight. The Rabbit Mountain District is eminently a silver-bearing country, and it has, as yet been but partially explored. To the north and west of Rabbit Mountain, around Lakes Shebandowan, Kashabowie, and north of Lac des Mille Lacs, sufficient prospecting has been done to prove it to be a gold-bearing district. Free gold has been found here, and some of the quartz taken from a vein near Partridge Lake yielded \$30 to the ton. To the west of Lake Shebandowan the Huronian Company's gold and silver mine is located, near Jack Fish Lake, and it may be said that this is one of the richest mines at which work has been done, that has yet been discovered in the Lake Superior region, and it is satisfactory to know that it is being actively and carefully developed by a strong Canadian company. The vein, which is a large one, is rich in mineral, and is free milling, a shaft is down 50 ft., and a drift of as many feet has been run on the vein, from which a large quantity of rich ore has been raised. The company have a 10-stamp mill and four Frue vanners ready to begin work on the ore, and it will not be long before the result of milling will be made known. It is a certainty that the Lake Superior district is rich in mineral, and when capital is available for the proper development of the mines their yielding capacity will be demonstrated, but not till then.

With regard to the source of the alluvial gold of the North-West Territories it is remarked that it has long been known that alluvial gold is found in the North-West Territories on the rivers flowing eastward from the Rocky Mountains. The Peace river and the North Saskatchewan have been especially noted in this connection. Now that the precious metals have been discovered in small quantities in the Rocky Mountains, near the proposed route of the Canadian Pacific Railway, the question is again asked, may not the gold of the Saskatchewan have been washed down the rivers from the mountains? This was the original popular theory, until many years ago, when Prof. Bell, of the Geological Survey, showed that it was much more probable that the gold came from the northward than the west. This opinion has since been quoted by Prof. Hind and Dr. Selwyn.

The gold, as Dr. Bell showed, is washed out of the drift which covers the auriferous strata of the plains, and as this drift came from the northward (as proved by its composition) it follows that the gold came from this quarter also. In the report referred to it was supposed that the gold might have been derived from Huronian rocks in the direction of Lake Athabasca, and since that time these rocks have actually been found to be well developed on this lake; but, although some of the alluvial gold of the plains may have had its source in this direction, Prof. Bell is of the opinion that it is quite as likely that the gold of the North Saskatchewan has been brought by the ancient glaciers from the valleys of the upper part of the Liard River and the northern branches of the Peace river. The reason why the gold is not found much above Edmonton is owing partly to the slope of the ground, and partly to the smaller glaciers of the drift period in that latitude proceeding eastward from the Rocky Mountains, keeping the great glaciers from the northward from approaching any nearer to the mountains.

The most reliable assays of ores from the recent discoveries in the Rocky Mountains, above referred to, show but little gold, and even if more should prove to exist the locality is too far south for any of it to have found its way into the North Saskatchewan, at the sources of which no gold has yet been found. On the other hand, it is well known that rich placers exist on the upper branches of the Liard and large quantities of gold have already been taken from them, especially in the Cassiar district. It, therefore, appears to us that Prof. Bell's explanation accounts best for all the facts.

The reports of the Select Standing Committee on Immigration and Colonisation of last session, which has lately been published, contains much valuable information on the country around Hudson's Bay. In his evidence, Prof. Bell, of the Geological Survey, says in answer to a question by Capt. Scott, of Winnipeg:—"In a general way, in the Hudson's Bay Territories are there any there useful minerals?" "As far as we know there are, but very little search has been made. I can, however mention numerous metals which are already known to exist. They embrace iron, as hematite, magnetite, clay ironstone, and rich manganiferous iron ore on the Eastmain coast, copper in the native state, and in various combinations, lead, silver, gold, molybdenum, antimony, manganese, chromium, phosphate of lime, jade, chrysophase, agate, cornelian, malachite, jasper, serpentine, jet, lazulite, petroleum, asphalt, peat, anthracite, bituminous coal, lignite, limestone, granite, sandstone, and sand for glass-making, moulding sand, clays, marls, ochres, gypsum, iron pyrites, salt, medicinal waters, sheet mica, soapstone, and plumbago. These are all known to occur, many in various parts of the Territory, and most of them certainly well worth looking after. Sir John Richardson mentioned that he thought it would be to the advantage of the Imperial Government and the Hudson's Bay Company to explore the country for minerals. He was convinced that it would not be long before the value of the mines of the Hudson's Bay Territory would far surpass that of the fur trade."

EPPS'S COCOA—GRATEFUL AND COMFORTING.—By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected cocoa, Mr. Epp's has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame.—*Civil Service Gazette.*—Made simply with boiling water or milk. Sold only in packets, labelled "JAMES EPPS & CO., Homeopathic Chemists, London."—Also makers of Epp's Chocolate Essence.

This Property will command a practical monopoly of the Coal Trade of the Danube, Black Sea, and Constantinople. Income from Contracts offered will amount to £30,000 per annum, equal to over 30 per cent. on the total Capital of the Company after payment of the Government royalty.

A further offer has been received to take the whole production of Coal at a clear profit of 10s. per ton.

The Iron Gate Coal and Chrome Company, Limited.

Incorporated under the Companies Acts, 1862 to 1880, whereby the liability of Shareholders is limited to the amount of their Shares.

CAPITAL £100,000, IN 100,000 SHARES OF £1 EACH,

Of which 20,000 are taken by the Vendor in part payment of the purchase-money, and the first issue of 50,000 are now offered for subscription, payable:—5s. per Share on Application, 5s. per Share on Allotment, and the balance, as and when required, in Calls of 5s. per Share, at intervals of not less than three months.

In the event of no Allotment being made, the amount payable on Application for Shares will be returned in full.

DIRECTORS.

Sir GEORGE INNES, Bart., Richmond, Surrey.
JAMES CROSTON, Esq., J.P., Manchester, and Upton Hall, Cheshire.
Mr. Alderman JENKINS, Higher Broughton, Manchester.
T. SAUNDERS, Esq., J.P., Holland Road, Kensington, W.
Mr. Councillor HUGO SHAW, Manchester.
THOMAS OLDHAM, Esq., Holmefield, Sale, Manchester.

SOLICITOR—J. H. BOARDMAN, Esq., 41, John Dalton Street, Manchester.

BANKERS—THE UNION BANK OF MANCHESTER AND BRANCHES. (Messrs. GLYN, MILLS, and CO., London Agents.)

AUDITORS—Messrs. JOHN ADAMSON, SON, and CO., Norfolk Street, Manchester.

SECRETARY (pro tem.)—Mr. F. W. DAWSON.

REGISTERED OFFICES—9, CORPORATION STREET, MANCHESTER.

ABRIDGED PROSPECTUS.

This company is formed for the purchase of concessions granted by the Crown of Hungary, of the mining rights in perpetuity over a district of about 25 square miles in extent, situated on the Danube at Tisovitz and Eibenthal, near the well-known city of Orsova, together with the freehold land at Tisovitz, and the works, houses, offices, and landing stages erected thereon, and the plant and machinery appertaining thereto, and for working the extensive and valuable deposits of coal and chrome thereon.

COAL.—This property has been inspected and favourably reported upon by some of the most eminent authorities—namely, Prof. Hull, F.R.S., F.G.S., Director of the Government Geological Survey of Ireland, and previously Government Inspector of Mines in Lancashire; Prof. V. Ball, F.R.S., F.G.S., Director of the Government Geological Survey of India, and Commissioner at the Vienna Exhibition, 1873; Nelson Boyd, Esq., F.G.S., M.E., J. E. Wood, Esq., C.E., F.R.S., Luke Blackwell, Esq., M.E., and others, who state that the coal on this property resembles both in appearance and quality the South Wales steam coal, being peculiarly adapted for use in locomotives, and for steam navigation, a fact that is proved by analysis.

The coal seams are vertical, or nearly so, and crop out on the flanks of the hills, and can be worked by adits, without machinery, for raising or draining. Four of the seams are already proved, and opened out by adit levels. These seams vary in thickness from 4 ft. to 20 ft., and the quality is excellent. Another seam 48 ft. in thickness, is stated to have been discovered, and others are known to exist. It is computed that these seams contain over 100,000,000 tons of workable coal, free from gas or water.

These collieries, being the nearest cheap source of supply for vessels navigating, and towns upon the Lower Danube, Black Sea, and Constantinople, will have the whole trade open to them, and no English coal can possibly compete on account of freight and charges, which to Galatz amount to 15s. to 20s. per ton, whilst it is estimated

the total cost to this company for coal delivered free on board will not be more than 5s. per ton. The selling price of steam coal at Galatz is stated to be about 39s. per ton, and for native coal further up the river 21s. to 33s. per ton. The supply from the collieries can easily be made equal to 2000 tons per week, and deliveries commenced forthwith.

The directors have already received an offer of contract for 20,000 tons of this coal per annum, for three years, with a clear profit to the company of 10s. per ton. A further offer has been received to take all the coal that can be delivered at the same rate of

The chrome ore crops out on the surface, and can be worked in open quarry, and the simple process of hand-picking would suffice to ensure a large immediate delivery, very little capital being required except for actual wages. The inspecting engineers concur in stating that the chrome ore can be delivered on the Danube, free on board at 5s. to 6s. per ton. A firm contract is already offered for 10,000 tons per annum, for three years, with a clear profit to the company of £2 per ton.

The demand for coal on the Danube, and for chrome in England, America, and on the Continent being continuous and increasing, and the sources of supply of the latter being few, a ready sale at highly remunerative rates may be always relied upon for a much larger output.

The purchase money agreed to be paid for the estate and mineral rights is £60,000, to be paid or satisfied as follows, viz., £16,000 in cash, £20,000 in fully paid-up shares, and the balance in coal and chrome from the property.

Copies of the reports, memorandum, and Articles of Association, can be seen at the offices of the company's solicitor. Prospectuses and forms of application for shares may be obtained from the solicitor, auditors, the bankers, and also at the offices of the company

PROVINCIAL STOCK AND SHARE MARKETS.

CORNISH MINE SHARE MARKET.—Mr. S. J. DAVEY, mine shareholder, Redruth (Feb. 14), writes:—Our market has been rather more active this week. East Pools, Agars, West Bassets, and West Poldice have been in demand, but Tincroft and Carn Breas close easier. The tone is steady to-day. Subjoined are the closing quotations:—Carn Breas, 2s. to 4s.; Gold Coast, 4s. to 6s.; Gold Hills, 5s.; Guinea Coast, 4s. to 8s.; Kapanga, 1s. 6d. to 2s. 6d.; Kohinoor, 5s. to 7s. 6d.; La Plata, 5s. to 6s. 3d.; Montana, 4s. to 4s. 5d.; Mysore Reefs, 2s. 6d.; Silver Peak, 2s. 3d.; Tolima (A), 6s. 6d. to 7s. 6d.; Victoria, 1s. to 1s. 6d.

In shares of local and miscellaneous companies prices have generally given way. Burtsland Oil has declined to 20; also Nobel's Explosives to 20, but the latter are now a little better. Home Mines Trust, 14s. to 16s.; and Lawes' Chemicals, 5s. to 5s.

EDINBURGH.—MESSRS. THOS. MILLER AND SONS, stock and share brokers, Princes-street (Feb. 13), write:—The railway markets have been flat during the past week, Caledonians and North British among others. In Canadians, Grand Trunk stocks have come again into favour, and an important rise has taken place in them, though the highest prices have not been maintained. In banks, National is 10s., and Bank of Scotland 2s. better, while Royal is 10s., and Union 7s. 6d. lower. Burinstland Oil have receded from 22 to 20s. 6d. Dalmeny from 23s. to 23, Midlothian from 11s. to 11s. 6d. Broxburn from 27s. to 27s. Young from 11s. to 11s. 6d. Pumperston have risen from 31s. 6d. to 36s. Assets shares have improved from 7s. 6d. to 8s.; Nobel's Explosives have receded from 22s. to 20s. In insurance shares, Caledonian have advanced from 17s. to 18s., North British and Mercantile from 25s. to 25s. Northern from 41s. to 42s. Scottish Union, A, have receded from 52s. to 52s. 6d. Prairie Cattle shares, which are now quoted ex dividend, are rather lower after making allowance for the dividend.

IRISH MINING AND MISCELLANEOUS COMPANIES SHARE MARKET.

CORK.—MESSRS. J. H. CARROL AND SONS, stock and share brokers, South Mall (Feb. 14), write:—Great Southern and Westerns changed hands to-day at 11s. 6d., Great Northerns at 11s. 6d., and Midlands at 8s. Waterford and Limericks remain 24s. to 24s., and Bandons 8s. Passages and Macrooms unaltered. Wicklows were done at 6s., and West Cork Preference at 9s. Bank stock changed hands at 32s., National Banks at 24s., and Hibernians at 26 13-16ths. No change in Provincial. Nothing done in Munsters. Alliance Gas remain 18 13-16ths to 18 15-16ths, and Cork Gas 7s. to 7s. West Kitty, 12s. to 12s. West Crebor, 9s. to 9s. West Phoenix, 9s. to 9s. West Franks, 7s. to 7s. West Kitty, 12s. to 12s. West Seton, 2s. to 2s. West Poldice, 9s. to 9s. West Agar, 11s. to 11s. West Bassett, 2s. to 2s. Wheat Grenville, 5s. to 5s. Wheat Peover, 1s. to 1s. Wheat Kitty, 9s. to 9s. Wheat Uny, 9s. to 9s. South Condurrow, 9s. to 9s.

—MR. M. W. BAWDEN, Liskeard (Feb. 15), writes:—The mining market presents no improvement, and prices are much the same. Carn Breas, St. Just United, Tincroft and West Bassett chiefly, dealt in at exceptionally low prices. Subjoined are the closing quotations:—Bedford United, 1s. to 1s.; Carn Breas, 2s. to 3s.; Cook's Kitchen, 9s. to 10s.; Dolcoath, 6s. to 6s. 6d.; Devon Consols, 3s. to 3s.; Devon Great United, 5s. to 5s.; East Cardigan, 9s. to 9s.; East Pool, 35s. to 36s.; Glasgow Cardigan, 9s. to 9s.; Gwawton United, 2s. 6d. to 5s.; Gunnislake (Clitters), 1s. to 1s.; Hungaton Down, 2s. 6d. to 5s.; Killifreth, 9s. to 9s.; Manx Vayle, 9s. to 9s.; New West Cambrian, 1s. to 1s. 6d.; Old Gunnislake, 9s. to 9s.; Phoenix United, 1s. to 1s.; Prince of Wales, 9s. to 9s.; Plushies, 1s. to 1s.; St. Just United, 3s. to 4s.; South Crofty, 3s. to 4s.; South Condurrow, 9s. to 9s.; St. Just United, 3s. to 4s.; South Franks, 5s. to 5s.; Tincroft, 4s. to 4s.; Killifreth, 9s. to 9s.; South Cardigan, 6s. to 6s. 6d.; South Condurrow, 9s. to 9s.; South Franks, 5s. to 5s.; South Crofty, 1s. to 1s.; South Condurrow, 9s. to 9s.; South Franks, 7s. to 7s. West Franks, 7s. to 7s. West Kitty, 12s. to 12s. West Seton, 2s. to 2s. West Poldice, 9s. to 9s. West Agar, 11s. to 11s. West Bassett, 2s. to 2s. Wheat Grenville, 5s. to 5s. Wheat Peover, 1s. to 1s. Wheat Uny, 9s. to 9s.

—MR. JOHN CARTER, mine share dealer, Camborne (Feb. 14), writes:—The share market closes with a dull appearance this week, and prices are again weaker following on the recent improvement reported last week. Tincroft have fallen to 4s., sellers, and Carn Breas are flatter at 9s. Subjoined are the closing quotations:—Carn Breas, 3s. to 3s.; Cook's Kitchen, 10 to 11s.; Dolcoath, 6s. to 6s. 6d.; Devon Consols, 3s. to 3s.; Devon Great United, 5s. to 5s.; East Cardigan, 9s. to 9s.; East Pool, 35s. to 36s.; Glasgow Cardigan, 9s. to 9s.; Gwawton United, 2s. 6d. to 5s.; Gunnislake (Clitters), 1s. to 1s.; Hungaton Down, 2s. 6d. to 5s.; Killifreth, 9s. to 9s.; Manx Vayle, 9s. to 9s.; New West Cambrian, 1s. to 1s. 6d.; Old Gunnislake, 9s. to 9s.; Phoenix United, 1s. to 1s.; Prince of Wales, 9s. to 9s.; Plushies, 1s. to 1s.; St. Just United, 3s. to 4s.; South Crofty, 3s. to 4s.; South Condurrow, 9s. to 9s.; St. Just United, 3s. to 4s.; South Franks, 5s. to 5s.; Tincroft, 4s. to 4s.; Killifreth, 9s. to 9s.; South Cardigan, 6s. to 6s. 6d.; South Condurrow, 9s. to 9s.; South Franks, 5s. to 5s.; South Crofty, 1s. to 1s.; South Condurrow, 9s. to 9s.; South Franks, 7s. to 7s. West Franks, 7s. to 7s. West Kitty, 12s. to 12s. West Seton, 2s. to 2s. West Poldice, 9s. to 9s. West Agar, 11s. to 11s. West Bassett, 2s. to 2s. Wheat Grenville, 5s. to 5s. Wheat Peover, 1s. to 1s. Wheat Uny, 9s. to 9s.

MANCHESTER.—MESSRS. JOSEPH R. AND W. P. BAINES, share brokers, Queen's Chambers, Market-street (Feb. 14), write:—During the greater part of the week the markets have been unsettled owing to fears of complications at the settlement, and consequently prices experienced further downward movement. As, however, the account which, theoretically is completed to-day, has passed off satisfactorily, confidence is to some extent restored and helped by some better returns of railway earnings, a better tone has been imparted, and values have rallied a little in some English rails. Foreign stocks are very irregular, and with only a moderate number of alterations, in which Spanish, marking about 1 lower, is the foremost. Egyptians fairly steady, the United 5s. and Prof. 5s. lower; but Dairy Sahie is 5s. better. The other changes are not of any importance. Mexican rails keep having to announce decreased traffic (this week's being 10,200L down), and are heavily depreciated again. They have been as low as 44s., and after some rapid and severe fluctuations now stand at 43 to 48s., or a fall of over 9 on the week. Sue Canal shares are lower also. Miscellaneous investments have produced a miserably poor record of transactions, and quotitons herein are not altered to an extent showing positive leaning of these markets in either direction.

BANKS quiter than for some time back, and fewer transactions marked, but this may be accounted for by the fact of dividends being past and gone. Values, too, probably fr. in the same cause, do not show the same strength as of late.

Sellers of Manchester and Salford ask 3s. more, and Union of Manchester have rallied to 7s. 6d.; whilst Bank of Liverpool is 5s.; Liverpool Commercial, 5s. to 5s.; and Manchester and Liverpool District, 5s.

INSURANCE.—Small business doing, but alterations for the better are in a majority.—Higher: Thames and Mersey Marine, 5s. to 5s.; Royal Liverpool, 5s.; Lancashire and Yorkshire Accident, 1s. to 1s.; Manchester Fire, 5s.; Lancashire, 5s.; and Boiler Insurance and Steam Power, 5s.—Lower: Reliance Marine, 5s.; British and Foreign Marine, 5s. to 5s.; and Queen, 5s.

COAL, IRON, &c., AND MINING.—Hardly anything d. ing., and prices where changed nearly all lower. Ebb Vales have lost most of their recent recovery. Bolckow unchanged, but quiet.—Higher: A. Knowles and Sons, 5s.; and Paulicello Copper, 2s.—Lower: Sheepbridge Coal, 2s. to 2s.; Chatterley Iron, 1s.; Telegraph Construction and Maintenance, 1s.; R. Hornsby and Sons, 5s. to 5s.; Great Laxey Lead, 5s.; Rio Tinto, 5s.; Staveley Coal, &c., 5s.; John Brown, 1s.; Ebb Vale Steel, &c., 5s.; and Tharsis Sulphur and Copper, 5s.

COTTON SPINNING, &c.—The continuance of the strike in East Lancashire keeps this market dull, and heavy prices do not suffer much quitably however, but the tendency appears to be towards ease.

TELEGRAPHES are better, only Western and Brazilian (down 3s) showing any decline, whilst Anglos of all issues are decidedly higher, and Directs and Globe div. still stand about same as before, being a rise to about the amount of the dividend payment.

CORPORATION STOCKS, &c.—Liverpool Three and a Half Consolidated Stock sensibly lower, but Oldham Debentures have improved 5s.; others steady, only a few lots changing hands.

MISCELLANEOUS.—Rydlands, Manchester Carriage B and C Issues, and Brush Electrics all more or less higher. Gas Light and Coke, A, London and Manchester Plate Glass, and West India and Pacific Steam each a little lower.

RAILWAYS.—Uneasiness has caused prices to recede further during the week, the fear of other failures at this settlement helping the decline. So far, however, matters have gone favourably, and yesterday's traffics, although conflicting, have engendered some little hopes of an improvement in trade bringing about a sensible recovery in home rails. Of Scotch lines Caledonians mark the principal change. Canadians have gained during most of the week, and with their decided improved traffic of 11,334, increase on the Grand Trunk joint lines, show a further 1 per cent. rise. Prices now are somewhat below at to-night's close, but there appears little disposition to enter into weighty engagements, and fluctuations are attributable to operations of "bears," who are still heavily interested.

NEWCASTLE-ON-TYNE.—MR. S. N. CHALLONER, stock and share broker, Grey-street (Feb. 14), writes:—Barrow steel Ordinary are without change at 7s. and Six per Cent. Pref. at 9 to 9s. Bolckow fully-paid at 19s. to 19s. and 12s. paid at 11 to 11s. C. Cannell and Co. at 6s. to 6s. 6d.; Earles', at 11 to 15, while Consett Iron are 5s. lower, at 20s. 6d. Ebb Vales 5s. to 5s. to 6s.; John Brown, 1s. to 5s. to 5s.; West Cumberland Iron 5s. to 5s. to 6s.; Sir W. G. Armstrong Mitchell 1s. to 12s. to 12s. Palmer A are firm at 26 to 26s., and B at 16s. to 17. North-Eastern Banks, 5s. higher, at 6s. to 6s.; Sadler and Co. (Limited) 5s. to 2s. to 2s. prem.; Newcastle Chemicals 5s., at 9s. 6d. to 42s. 6d., and Langdale 5s. to 5s. High Gosforth Park remain 15. Lawes' Ordinary, 5s. to 5s.; while Prof. are 5s. higher, at 10s. to 10s. Rhymney Iron are 27s. to 30s.; Oulton Iron, 20s. to 20s. 6d.; Paulicello Copper, 5s. to 5s. to 5s. 6d.; Pelssall Coal, 11 to 12; Tees-side Iron Ordinary, 15s. to 20s., and Ten per Cent. Pref. 1s. to 13s. Darlington Irons, 24s. to 25s. Consett Spanish are 5s. to 5s. 6d.; John Abbott, 40 to 41. Whithby and Redcar Railway, 25 to 30; Maryport and Carlisle, 19s. to 19s.; Hull and Barnsley, 4s. to 4s.; Furness, 11s. to 11s.

SCOTCH MINING AND INDUSTRIAL COMPANIES SHARE MARKETS.

STIRLING.—MR. J. GRANT MACLEAN, stockbroker and ironbroker (Feb. 14), writes:—During the past week the markets have been dull, owing to the state of affairs in Egypt, adverse rumours regarding financial credit, and the dull state of trade. Prices are now, as a rule, very dull, and with cheap money and favourable spring weather a recovery may reasonably be looked for. Transactions now entered into are for the new account (Feb. 28).

In shares of coal, iron, and steel companies the principal business has been in Marbelles, which declined from 7s. to 5s. on the issue of their report, but they have since recovered to about 5s. 6d. Bell's Iron and Steel, 15s. 6d. to 2s. 6d.; Cardiff and Swansea, 5s. to 5s.; Shotts have declined to 3s.; West Cumberland, 1s. to 13s.; and Wigton Iron, 40 to 44.

In shares of foreign copper concerns prices are steady. Tharsis have sold off 6s. 6d. to 6s. 17s. Arizonas have declined from 2s. to 2s. 6d.; Bells are at 40s. to 50s.; Brabesberg, 3s. 6d. to 3s.; Copiapo, 5s. 6d. to 6s. 6d.; Michigosten, 12s. 6d.; Mason and Barry have declined to about 12; and Pierrefitte, 1s. 2s.

In shares of home mines there is no particular change in prices. Tin shares should be worth attention at present low prices, seeing the market for that metal is inclined to improve. Herdfoot shares still off-red. Auderton are at 12s. 6d. to 17s. 6d.; Bedford United, 2s. to 2s. 6d.; Carn Breas, 5s. to 7s. 6d.; Ecton, 3s. 6d. to 3s.; Gravest West Cliverton, 5s. to 7s. 6d.; Goodrige, 2s. 6d. to 12s. 6d.; Great Laxey, 10 to 10s.; Gunnislake (Clitters), 2s. 6d. to 5s.; Leatholm, 5s. 6d. to 5s. 6d.; Mellanear, 2s. to 3s.; Monkton Mansions, 10s. to 20s.; Mounts Bay, 3s. to 3s.; New Trumpet, 17s. 6d. to 22s. 6d.; Old Gunnislake, 5s. to 5s.; Parkes, 7s. 6d. to 8s. 3d.; Old Shepherd, 15s. to 17s.; Old Tintagel, 5s. 6d. to 5s. 6d.; St. Just United, 40s. to 50s.; Tamar, 7s. 6d. to 12s. 6d.; Tredegar, 1s. 2s. to 1s. 3s.; Tregonites, 1s. to 2s.; West Bassett, 50s.; Wheal Bassett, 60s. to 70s.; and Wheal

In shares of gold and silver mines business has been quiet. United Mexicans have been steady between 9 and 10. Chil (Debentures) wanted. Asia Minor are at 5s. to 7s.; Appletonia, 40s.; Chontales, 3s. to 4s.; Chile, 12s. to 12s. 6d.;

hurst, East Grinstead, Lieut. Colonel; M. W. Wilson, Ranceby Hall, Sleaford; W. M. Bell, 40, Pall Mall, Major; J. W. D. Johnson, J.P., Temple Belwood, Doncaster; E. W. Wilson, Castlegate, Newark; A. B. Wilson, Ranceby, Sleaford, Lieut.-Colonel; C. J. Hambro, Milton Abbey, Dorset.

WENALTY MERTHYR COLLIERY COMPANY (Limited).—Capital 6000L, in shares of 50s. To purchase the Wenalty Mertyr Colliery, Neath, county of Glamorgan, and all stock, plant, &c., belonging to the said colliery. The subscribers are—T. Coor, Cambrian Place, Swansea, 10; J. R. Leaver, Brookland-terrace, 15; J. Helmer, Cambrian-place, 10; J. C. Leaver, Castlemain, 15; L. Guenet, Cardiff, 10; J. Livingston, St James's Crescent, Swansea, 10; J. H. Bowges, Swansea, 10.

SCIENTIFIC PRINCIPLES OF ORE CRUSHING.

The most important problem in the concentration of ore, says Mr. LUTHER WAGONER, C.E., M.E., in an interesting series of notes on ore crushing, recently published in the Engineering and Mining Journal of New York, is the reduction to grains of a maximum diameter, avoiding the production of dust. Thus, if 1-50 of an inch (0.5 m.m.) be the maximum size of grain that will sufficiently liberate the valuable mineral, theory shows that all the grains should be of this size, in order to permit of an easy separation of the minerals according to their densities. But it is well known that ore cannot be broken at all without producing grains that range in size from the largest pieces down to a dust of extreme fineness; therefore, in practice, we must endeavour to produce the minimum amount of dust. Now, if a second blow be struck upon the partially reduced mass, some of the under-sized grains will be still further reduced. The nature of the blow must also be considered. It is plain that it might be heavy enough to reduce the whole mass to dust at once, or it might be light enough to just halve the piece. Hence we will easily see that, if the ore be successively struck such blows as will just halve the pieces, removing all sufficiently reduced grains at the time they are formed, we have a practical solution of the problem. For the purpose of examining more thoroughly what takes place when ore is reduced in the various mills, specimens of the pulp were obtained from various places, and the results are given in the accompanying diagram. For the purpose of reducing battery screens to uniform measure, the set of standard needles used for gauging the holes in Russia iron screens was measured, the result being given in the subjoined table, which shows the net space between the wires of cloth used for battery screens and sieves at San Francisco, California:—

Trade No. or Holes to the Linch.	Brass wire cloth.	Steel wire cloth.	Steel wire cloth.
m. m.	Inches.	m. m.	m. m. Inches.
12	1.55	0.0610	—
14	1.32	0.0520	—
16	1.25	0.0490	—
18	1.09	0.0430	—
20	0.94	0.0370	—
24	0.73	0.0290	0.69 0.027 0.64 0.025
30	0.55	0.0220	0.56 0.022 0.46 0.018
35	0.47	0.0190	0.49 0.019 0.38 0.015
40	0.40	0.0160	0.43 0.017 0.33 0.013
50	0.30	0.0120	0.36 0.014 0.26 0.011
60	0.25	0.0100	0.29 0.011 0.19 0.008
64	0.24	0.0090	0.28 0.011 0.18 0.007
70	0.22	0.0090	0.25 0.010 0.16 0.006

MINING PROGRESS IN CANADA.

Although as compared with other dependencies of the British Crown capitalists have given very little assistance to Canada there can be no question that every province of the Dominion possesses mineral resources which are well worth their attention. With regard to the Eastern provinces it is stated that there is an abundance of good iron ore, hematite, on the Cobequid Mountains at Acadia Mines, Nova Scotia, where the Canada Steel Company has located works giving employment to 500 men. The output of ore last year was 50,000 tons, which was made into pig and bar iron, car wheels, &c., valued at over \$600,000. Iron ore is found in other localities, but not to any such extent as here. The largest colliery in Canada is at Spring Hill Mines, N.S., where about 500 men are employed, and the output last year amounted to 200,300 tons of coal, or nearly one-sixth of the entire production of Nova Scotia. At Stellarton, N.S., 141,000 tons of coal were raised last year, and 12,512 tons of coke manufactured. At Sydney, Cape Breton, the coal fields underlie over 200 square miles, the greater part of which is under the Atlantic. Mining rights covering over one-half of this submarine coal have been taken out. The Sydney Mines give employment to about 15,000 men, and coal is seen, smelted, and felt everywhere. At Picton, N.S., coal has been exported since 1798, though the amount was small till 1829. It is now the principal business of the port. At Bridgeport, C.B., the International Coal Mines give employment to 300 men and boys, and the output for last year was 109,286 tons. At the Joggins Mines, N.S., an attempt has been made to obtain railway facilities from Maclean on the Intercolonial Railway, so that the coal now mined there may find a more ready market. The famous Albertite coal that was obtained from the Albert Mines, New Brunswick, for several years has become exhausted, and mining has been discontinued.

The Nova Scotian gold mines appear to be yielding excellent returns, considering the small amount of money and labour that is being expended upon them. At Mount Uniacke there are three gold mines and four quartz mills; 3440 tons of quartz were crushed, furnishing 9128 days' employment, and yielding \$3.52 per day per man. This was the best return of any mine in the province. At Sherbrooke the ore is low grade, but easily worked, and distributed in large quantities over an area of 18 square miles. The yield of six quartz mills last year was 2572 ozs. 17 dwt. 14 grs. At Goldenville, three miles from Sherbrooke, \$500 was found the day the mines were discovered in 1861, and there has been a yield of \$2000 per man, per year, during some years. At Tangier the yield last year was 789 ozs. from 1622 tons of ore. At Waverley the yield was 234 ozs. 7 dwt. 5 grs., from 554 tons of ore, three mines having been worked and 2238 days' labour performed. At Wine Harbour the ore is easily worked, but poor, yielding only 94 cents per day per man. At Country Harbour 903 ozs. were obtained last year from 511 tons of quartz, and the Oxford Gold Mining Company, of Chezzetcook, obtained \$6800 from 130 tons of ore worked during 12 days in May, 1882.

At present the reciprocity movement for securing a treaty between Canada and United States for the mutual removal of duties on coal and iron ore. The miners engaged in raising those products are naturally delighted, but the feeling in favour of such a treaty is by no means universal; many see that the result would be to add to the manufacturing power of the United States without conferring any corresponding benefit upon either Canada or England. The Reciprocity Association has quite recently held a meeting in America when Mr. E. N. Fribbie was appointed President; Mr. W. C. Andrews, treasurer; and Mr. C. J. Pusey, secretary. Representatives were present of the coal and iron interests of Cleveland, Youngstown, Toledo, and other points. A committee was appointed which, with one from the Board of Trade of Montreal, went to Ottawa, and on Saturday last held a conference with Sir Leonard Tilley, Minister of Finance, and the Hon. Mr. Bowell, Minister of Customs. In their report to the association at the meeting the committee stated that it found the Canadian ministers anxious to have lumber and salt included in the proposed treaty, but the New York committee was not prepared to give them any encouragement on that point. The committee had every reason to believe that the Dominion Government was very favourably disposed to the proposed treaty, and that if Congress should place Canadian iron ore and coal on the free list, the Dominion Cabinet would exercise the power vested in it and place the same products of the United States on a similar list. A committee headed by the Hon. Galusha A. Grow was appointed to press the matter of a treaty at Washington. A wrong impression, says the New York Engineering and Mining Journal, is abroad that this movement originated in Canada. It had its origin in the United States. The fact that a delegation from the Montreal Board of Trade accompanied the American committee to Ottawa may explain the mistaken impression. It is proposed to ask the present Congress to pass an act allowing Canadian coal and iron ore to be entered free of duty, provided that the Canadian Parliament will also pass a similar act in regard to American iron ore and coal. Efforts will be made to urge immediate action on the part of Congress, and several Congressman pledged to support the movement at the proper time. Should such legislation be obtained as desired, both in the States and in Canada, the greatest benefit will be to the States, for Canada will be giving up revenue to the amount of about \$1,000,000, whilst the United States will have to give up only about \$250,000 in revenues, but if Canada gives up much more at first than the United States does Canada looks forward to the development of her iron mines, whose ores are specially adapted to making Bessemer steel, and in the long run the advantages will undoubtedly balance.

The producers of bituminous coal in Northwestern Pennsylvania, who seek a market in and through Buffalo and Rochester, held a meeting yesterday at the Victoria Hotel, to consider the annual production and to consult with the agents of the railroads leading to those points, as to freight rates on their product during the year and as to the general interest of the bituminous coal trade. The representatives of the principal companies were present and ultimately, Messrs. Galusha A. Grow was elected Chairman, and A. Dowdell, secretary. A committee was appointed to report on the annual production of bituminous coal for the Buffalo and Rochester markets and the best method to regulate the output. The following resolution was unanimously adopted, on the motion of E. N. Fribbie:—It was resolved.—“That we are in favour of reciprocity with Canada on coal and iron ore, and we heartily approve the efforts making by the ‘Association for Reciprocity on Coal and Iron ore’ to secure the necessary action by the Governments of the United States and Canada to obtain such a result.” The committee on coal production reported in favour appointing a committee representing the railroads and the producers of bituminous coal which should have power to regulate the annual production.

The nature of the phosphate deposits and the question, Will Deep Mining Pay? are ably discussed by Mr. Henry G. Vennor, F.G.S., in the last number of the Canadian Mining Review. He states “that in the present active state of phosphate mining and general enquiry concerning our mines, it will be of interest to consider briefly the conditions of the deposits, and more particularly what evidence there is of these being deep-seated. I have elsewhere stated—and oftener than once—that the apatite rocks were, geologically considered, superficial. Hence the query naturally arises, Will Deep Mining Pay? This question is an important one at the present time when so much capital is being invested in mines and mining properties, but, in so far as I have seen, no answer of a satisfactory nature has yet been given. The question, however, is a simple one, when we look into the nature of the deposits—i.e., their geological conditions. The miner, who hitherto has been at work at economic ores in true fissure veins cutting alike all the rocks of a particular mining district, is entirely at sea when he is placed in the phosphate field. He may talk as he pleases about being on or off the main lode, but of one thing only is he really certain and that is of being supremely puzzled. Tell him to search in the direction of the bedding and he will laugh you to scorn and inform you that true veins but rarely run so. Yet, such is the truth—the very truth—in the case of phosphate deposits. These are nothing more than a series of irregular (large and small) masses distributed along one or two plains of bedding in one particular belt of rock. Leave this particular belt and you lose your phosphate; follow it and you continue to discover new deposits. This is only natural, of course, and is the case with iron ore and similar deposits, true veins occur as spurs or infiltrations

from these embedded masses, but only run for very limited distances. The very finding, however, of one or two of such veins is enough for the embryo mineralogist and geologist, and he hastens to set it down as an established fact.

Many British capitalists being interested in Lake Superior mines it is gratifying to find that fair progress is being made. The Canadian Mining Review states that at Silver Islet about 50 miners are employed, a depth of 1200 ft. has been reached, and on the 1160 ft. level they are drifting both ways. The mine is said to be yielding silver in paying quantities. This company owns a large tract of land on the main shore at Mamainse, which has been successfully prospected, and native copper, yellow and gray copper ores in veins have been discovered, as well as native silver, said to be very rich. On the property adjoining this last mentioned location, the Lake Superior Native Copper Company are expending about \$12,000 per month, and employ 175 men. A shaft has been sunk 200 ft., and in one of three levels they have drifted 600 ft. The ore at the depth obtained carries about 3 per cent. of metal. The Michipicoten Native Copper Company are doing good work at their mine, to the north-west of the Lake Superior Native Copper Company's property, and it is said they have struck ore rich in native copper. Both of these mines are being worked by English capital. Within 25 miles of Port Arthur the Rabbit Mountain Silver Mine is located, and of this property much has already been read in the Canadian press. Nuggets of black silver, weighing as much as 12 lbs. each, have been taken from the vein, through which silver appears well disseminated. The vein is unquestionably a large one, and a large quantity of silver is in sight. The Rabbit Mountain District is eminently a silver-bearing country, and it has, as yet been but partially explored. To the north and west of Rabbit Mountain, around Lakes Shebandowan, Kashabowie, and north of Lac des Mille Lacs, sufficient prospecting has been done to prove it to be a gold-bearing district. Free gold has been found here, and some of the quartz taken from a vein near Partridge Lake yielded \$30 to the ton. To the west of Lake Shebandowan the Huronian Company's gold and silver mine is located, near Jack Fish Lake, and it may be said that this is one of the richest mines at which work has been done, that has yet been discovered in the Lake Superior region, and it is satisfactory to know that it is being actively and carefully developed by a strong Canadian company. The vein, which is a large one, is rich in mineral, and is free milling, a shaft is down 50 ft., and a drift of as many feet has been run on the vein, from which a large quantity of rich ore has been raised. The company have a 10-stamp mill and four Frue vanners ready to begin work on the ore, and it will not be long before the result of milling will be made known. It is a certainty that the Lake Superior district is rich in mineral, and when capital is available for the proper development of the mines their yielding capacity will be demonstrated, but not till then.

With regard to the source of the alluvial gold of the North-West Territories it is remarked that it has long been known that alluvial gold is found in the North-West Territories on the rivers flowing eastward from the Rocky Mountains. The Peace river and the North Saskatchewan have been especially noted in this connection.

Now that the precious metals have been discovered in small quantities in the Rocky Mountains, near the proposed route of the Canadian Pacific Railway, the question is again asked, may not the gold of the Saskatchewan have been washed down the rivers from the mountains? This was the original popular theory, until many years ago, when Prof. Bell, of the Geological Survey, showed that it was much more probable that the gold came from the northward than the west. This opinion has since been quoted by Prof. Hind and Dr. Selwyn.

The gold, as Dr. Bell showed, is washed out of the drift which covers the auriferous strata of the plains, and as this drift came from the northward (as proved by its composition) it follows that the gold came from this quarter also. In the report referred to it was supposed that the gold might have been derived from Huronian rocks in the direction of Lake Athabasca, and since that time these rocks have actually been found to be well developed on this lake; but, although some of the alluvial gold of the plains may have had its source in this direction, Prof. Bell is of the opinion that it is quite as likely that the gold of the North Saskatchewan has been brought by the ancient glaciers from the valleys of the upper part of the Liard River and the northern branches of the Peace river. The reason why the gold is not found much above Edmonton is owing partly to the slope of the ground, and partly to the smaller glaciers of the drift period in that latitude proceeding eastward from the Rocky Mountains, keeping the great glaciers from the northward from approaching any nearer to the mountains.

The most reliable assays of ores from the recent discoveries in the Rocky Mountains, above referred to, show but little gold, and even if more should prove to exist the locality is too far south for any of it to have found its way into the North Saskatchewan, at the sources of which no gold has yet been found. On the other hand, it is well known that rich placers exist on the upper branches of the Liard and large quantities of gold have already been taken from them, especially in the Cassiar district. It, therefore, appears to us that Prof. Bell's explanation accounts best for all the facts.

The reports of the Select Standing Committee on Immigration and Colonisation of last session, which has lately been published, contains much valuable information on the country around Hudson's Bay. In his evidence, Prof. Bell, of the Geological Survey, says in answer to a question by Capt. Scott, of Winnipeg:—“In a general way, in the Hudson's Bay Territories are there many useful minerals?” “As far as we know there are, but very little search has been made. I can, however mention numerous metals which are already known to exist. They embrace iron, as hematite, magnetite, clay ironstone, and rich manganiferous iron ore on the Eastmain coast, copper in the native state, and in various combinations, lead, silver, gold, molybdenum, antimony, manganese, chromium, phosphate of lime, jade, chrysophase, agate, cornelian, malachite, jasper, serpentine, jet, lazulite, petroleum, asphalt, peat, anthracite, bituminous coal, lignite, limestone, granite, sandstone, and sand for glass-making, moulding sand, clays, marls, ochres, gypsum, iron pyrites, salt, medicinal waters, sheet mica, soapstone, and plumbago. These are all known to occur, many in various parts of the Territory, and most of them certainly well worth looking after. Sir John Richardson mentioned that he thought it would be to the advantage of the Imperial Government and the Hudson's Bay Company to explore the country for minerals. He was convinced that it would not be long before the value of the mines of the Hudson's Bay Territory would far surpass that of the fur trade.”

EPPS'S COCOA—GRATEFUL AND COMFORTING.—“By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected cocoa, Mr. Epp's has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame.”—*Civil Service Gazette*.—Made simply with boiling water or milk. Sold only in packets, labelled “JAMES EPPS AND CO., Homeopathic Chemists, London.”—Also makers of Epp's Chocolate Essence.

This Property will command a practical monopoly of the Coal Trade of the Danube, Black Sea, and Constantinople. Income from Contracts offered will amount to £30,000 per annum, equal to over 30 per cent. on the total Capital of the Company after payment of the Government royalty.

A further offer has been received to take the whole production of Coal at a clear profit of 10s. per ton.

The Iron Gate Coal and Chrome Company, Limited.

Incorporated under the Companies Act, 1862 to 1880, whereby the liability of Shareholders is limited to the amount of their Shares.

CAPITAL £100,000, IN 100,000 SHARES OF £1 EACH,

Of which 20,000 are taken by the Vendor in part payment of the purchase-money, and the first issue of 50,000 are now offered for subscription, payable:—5s. per Share on Application, 5s. per Share on Allotment, and the balance, as and when required, in Calls of 5s. per Share, at intervals of not less than three months.

In the event of no Allotment being made, the amount payable on Application for Shares will be returned in full.

DIRECTORS.

Sir GEORGE INNES, Bart., Richmond, Surrey.
JAMES CROSTON, Esq., J.P., Manchester, and Upton Hall, Cheshire.
Mr. Alderman JENKINS, Higher Broughton, Manchester.
T. SAUNDERS, Esq., J.P., Holland Road, Kensington, W.
Mr. Councillor HUGO SHAW, Manchester.

THOMAS OLDHAM, Esq., Holmefield, Sale, Manchester.

SOLICITOR.—J. H. BOARDMAN, Esq., 41, John Dalton Street, Manchester.

BANKERS.—THE UNION BANK OF MANCHESTER AND BRANCHES.

(Messrs. GLYN, MILLS, and CO., London Agents.)

AUDITORS.—Messrs. JOHN ADAMSON, SON, and CO., Norfolk Street, Manchester.

SECRETARY (pro tem.)—Mr. F. W. DAWSON.

REGISTERED OFFICES—9, CORPORATION STREET, MANCHESTER.

ABRIDGED PROSPECTUS.

This company is formed for the purchase of concessions granted by the Crown of Hungary, of the mining rights in perpetuity over a district of about 25 square miles in extent, situate on the Danube at Tisovitz and Eibenthal, near the well-known city of Orsova, together with the freehold land at Tisovitz, and the works, houses, offices, and landing stages erected thereon, and the plant and machinery appertaining thereto, and for working the extensive and valuable deposits of coal and chrome thereon.

COAL.—This property has been inspected and favourably reported upon by some of the most eminent authorities—namely, Prof. Hull, F.R.S., F.G.S., Director of the Government Geological Survey of Ireland, and previously Government Inspector of Mines in Lancashire, Prof. V. Ball, F.R.S., F.G.S., Director of the Government Geological Survey of India, and Commissioner at the Vienna Exhibition, 1873, Nelson Boyd, Esq., F.G.S., M.E., J. E. Wood, Esq., C.E., F.R.S., Luke Blackwell, Esq., M.E., and others, who state that the coal on this property resembles both in appearance and quality the South Wales steam coal, being peculiarly adapted for use in locomotives, and for steam navigation, a fact that is proved by analysis.

The coal seams are vertical, or nearly so, and crop out on the flanks of the hills, and can be worked by adits, without machinery, for raising or draining. Four of the seams are already proved, and opened out by adit levels. These seams vary in thickness from 4 ft. to 20 ft., and the quality is excellent. Another seam 48 ft. in thickness, is stated to have been discovered, and others are known to exist. It is computed that these seams contain over 100,000,000 tons of workable coal, free from gas or water.

These collieries, being the nearest cheap source of supply for vessels navigating, and towns upon the Lower Danube, Black Sea, and Constantinople, will have the whole trade open to them, and no English coal can possibly compete on account of freight and charges, and forms of application for shares may be obtained from the solicitor, auditors, the bankers, and also at the offices of the company

the total cost to this company for coal delivered free on board will not be more than 5s. per ton. The selling price of steam coal at Galatz is stated to be about 39s. per ton, and for native coal further up the river 21s. to 33s. per ton. The supply from the collieries can easily be made equal to 2000 tons per week, and deliveries commenced forthwith.

The directors have already received an offer of contract for 20,000 tons of this coal per annum, for three years, with a clear profit to the company of 10s. per ton. A further offer has been received to take all the coal that can be delivered at the same rate of profit.

The chrome ore crops out on the surface, and can be worked in open quarry, and the simple process of hand-picking would suffice to ensure a large immediate delivery, very little capital being required except for actual wages. The inspecting engineers concur in stating that the chrome ore can be delivered on the Danube, free on board at 5s. to 6s. per ton. A firm contract is already offered for 10,000 tons per annum, for three years, with a clear profit to the company of £2 per ton.

The demand for coal on the Danube, and for chrome in England, America, and on the Continent being continuous and increasing, and the sources of supply of the latter being few, a ready sale at highly remunerative rates may be always relied upon for a much larger output.

The purchase money agreed to be paid for the estate and mineral rights is £60,000, to be paid or satisfied as follows, viz., £16,000 in cash, £20,000 in fully paid-up shares, and the balance in coal and chrome from the property.

Copies of the reports, memorandum, and Articles of Association, can be seen at the offices of the company's solicitor. Prospectuses and forms of application for shares may be obtained from the solicitor, auditors, the bankers, and also at the offices of the company

Nevada, average pulp; 7, wet, stamps, N. Y. Hill Mine, Grass Valley, Cal., quartz; 8, dry, Dodge crusher, Knox Mine, Mokelumne Hill, Cal., quartz; 9, wet, stamps, Porter Mine, Calaveras Co., Cal., quartz, silver ore; 11, dry, Kroun rolls, Geddes and Bertrand mill, Nevada, silver ore; 12, dry, Dodge crusher, Redwing, Murphy's, Calaveras Co., Cal., quartz; 13, dry, Dodge crusher, Knox Mine, Calaveras Co., Cal., quartz; 14, dry, Tustin pulveriser, Redwing, very hard, tough quartz; 15, wet, stamps, Redwing, very hard, tough quartz; 16, ideal curve. It will be at once observed that all stamp mill curves are convex towards the origin of co-ordinates, while roller mill curves are concave. The very remarkable curve, No. 14, with its small percentage of slimes, was obtained from an exceedingly hard, tough quartz, carrying about $\frac{1}{2}$ per cent. of grey copper ore. The ore was broken to $\frac{1}{2}$ in. in a rock breaker, dried, and passed through the Tustin pulveriser, which may briefly be described as an annular ring, 18 in. by 48 in. diameter, slatted with $\frac{1}{2}$ in. by 12 in. slats, and 18 in. by 48 in. inside an external screen, and two loose rollers of cast-iron, one 16 in. by 18 in. diameter, and the other 18 ft. long by 20 in. diameter, which rest inside of the ring. The rollers serve to crush the ore by their weight and the rotation of the ring, the peripheral speed being 5 ft. per second. The construction is such that the crushed ore is nearly all removed at each revolution, as about ten times as much available screen surface is allowed in the machine as compared with that of a wet-stamp mill. One of the essentials of a good mill—a prompt removal of the crushed ore is well carried out; the other essential that the blow must be proportional to the work is a compromise, and is perhaps as good as can be obtained where the ore is all reduced in the same machine. Compare this curve with No. 15, representing work on the same ore and screen, but crushed in a wet stamp-mill. About 50 per cent. more of ore finer than 100 mesh is obtained; the extreme hardness of the quartz and the very brittle nature of the mineral made it impossible to concentrate the ore when wet crushed, the tetrahedrite floating away with the battery water. Curves 6 and 10 are from the same ore, the experiment being made to see what difference would be made in crushing a small piece of quartz with and without sifting. With the exception of No. 2 all the samples were taken by the writer.

The Dodge machine offers an abundance of screen surface for the escape of the ore, perhaps more even than the Tustin; but it employs cobblestones or hard lumps of the same ore to reduce the fragments which have passed a closely set rock-breaker. The action is thus partially abrasive, and a certain amount of dust is produced that the purely rolling or percussive action would avoid. It is this abrasive action that causes curves 8 and 12 to have contrary flexures. Only one sample of work from rolls could be procured, No. 11; but the screen is too coarse to admit of more than conjecture of what it would do on work ranging from No. 24 to No. 70 sieve; the convexity of the curve would indicate that it would still remain so on finer work. Curves 8 and 13 represent work on the same ore, but with different screens. The production of so great a quantity of slimes by stamps is directly traceable to two causes—First, the blow is often in excess of what is needed, thereby over-crushing much of it. Secondly, a failure to promptly remove the crushed ore, through insufficient screen surface, which causes the ore to be churched and hammered still finer; practically the latter is the most serious of the two, because it will always be necessary to break the ore in some manner, while it is always possible to devise some more efficient method of removing the crushed ore than that now in use. The practical conclusions to be drawn from the diagram are—Stamps can never be used successfully for the preparation of gold and silver ores for concentration; and in any successful machine whose work will approximate to the ideal curve 16 the following principles must be regarded. The blow must be proportioned to the work; no abrasive action upon the ore is wanted; the ore when crushed to proper size must be immediately removed; it cannot be reduced in the same machine; it must work either wet or dry and it must be simple, strong, and durable.

NORTHERN INSTITUTE OF MINING AND MECHANICAL ENGINEERS.

At the general meeting of the members of this Institute, held in the Wood Memorial Hall, Newcastle, on Saturday, Mr. G. B. FOSTER in the chair, there was a large attendance. Professor Labour read an excellent and useful practical paper "On a Great Fault at Annistead, in North Northumberland," in which he described one of the most natural sections and one of the greatest dislocations of the strata in Northumberland, and he also gave an example of the kind of reasoning by means of which the position of an unseen fault might often be inferred with certainty. Detailed descriptions were given of the North Sunderland and Beadnell limestone.

A paper was read by Mr. Henry White, giving an account of an occurrence which took place at West Stanley Colliery on Dec. 11, 1883. It appears that on that day a chimney 46 ft. in height was struck by lightning, and afterwards the electric current descended the shaft, following the course of the iron signal-rope. At the bottom of the shaft the flash was seen to pass from the handle of the signal rope to some metal piping a few feet distant. The descent of lightning down coal shafts has often occurred in this district. Many years ago an explosion occurred in a mine on the north side of the Tyne, and as there was no one in the mine at the time it was concluded as this occurred during a thunderstorm that the electric fluid had descended the shaft, and ignited the gas. This appears to point to the conclusion that it is necessary to attach to colliery chimneys and other prominent objects at these works lightning conductors, so that if struck the fluid may be conducted into the earth as direct as possible.

Mr. Thomas E. Candler gave a description of Thompson's patent centrifugal pulveriser—a machine on which rock and minerals are crushed through the action of a round steel ball being caused to rotate by the action of the edges of two discs inside a case lined with steel, so that the centrifugal force of the ball crushes the mineral against the case, from which it escapes laterally. This interesting meeting concluded by votes of thanks being passed to the gentlemen who had contributed the papers, which certainly possess more than ordinary interest.

MANCHESTER ASSOCIATION OF EMPLOYERS AND FOREMEN.

At the twenty-eighth annual meeting on Feb. 9 the accounts showed a good surplus on the year's income and expenditure, and the Society is in a healthy and prosperous condition. Mr. DANIEL ADAMSON, O.E. (the Chairman), remarked that they were greatly indebted to science for the exact knowledge they now possessed as to the composition of the ordinary commercial irons, and in carrying out their work of the present day it was indispensable that they should know what the material they used was composed of, how to treat it, and how to load it. Mr. Adamson then strongly urged the adoption of mild steel for various purposes. By its employment in the manufacture of guns the Government would have a much better material at half the cost than their present system, whilst such material was eminently fitted for bridge and girder construction, and if the knowledge they now possessed had been available when the first Tay bridge was built, he felt sure that the terrible disaster which occurred a few years back would never have taken place. He hoped that the scientific knowledge now available with regard to metals would have such an influence that men would insist upon good materials which would not come to grief when tested. With regard to welding scientists knew the materials that would weld, and it, therefore, became necessary that the services of the chemist should become an auxiliary in their ironworks. He earnestly hoped that their friends at the Victoria University and the Mechanics Institution would give such instruction as would ensure a sufficient knowledge as to the character of the hidden metals that they would have less of awful disasters in the future. They ought to encourage by every means an exact knowledge as to metals, and that association might do a great service and increase its usefulness by promoting a thorough knowledge of the composition of metals in the direction he had indicated.

It was not a question of reduction in wages, but improvement in production, that would enable them to compete successfully in all the foreign markets, and exactness of knowledge as to the materials they used, as well as exactness in construction, their reputation for which had been so well maintained by Sir Joseph Whitworth and Co., which largely contributed to success.

Mr. THOS. ASHBURY, C.E. (President) said the want of co-operation between foremen and draughtsmen in the engineering trades for many years had been deeply deplored. There existed between them no public and recognised channel of communication, and as a body they were unable to consult for their general interests or individual advantage. While isolated from the men under their charge, and held by their employers at a respectful distance, the foremen engineers were in a solitary and unenviable position. To remedy this, in 1852 the London Association of Foremen Engineers was formed, and four years later, in 1856, their Manchester Association was established, but with a wider basis, taking in employers as well as foremen and draughtsmen of the engineering and mechanical trades. It had always been a prominent feature in their Association to encourage and cultivate those friendly relations between employers and employed, which tended so much to their mutual advantage, and never, under any circumstances, were the politics or the secrets of the trade discussed, and never had there been known any breach of confidence. One of the chief objects of the Association was to bring together those engaged in the direction and superintendence of engineering and mechanical works, for mutual acquaintance, and for promoting the exchange of opinions on interesting questions constantly arising from the progressive nature of the mechanical trades. In addition, they had funds, out of which they provided pecuniary assistance to members when required, and superannuation allowance for the aged. The Association had been eminently successful in the past, and it had a very hopeful future before it.

PULVERISERS VERSUS STAMPS.

At the meeting of the North of England Institute of Mining and Mechanical Engineers, at the Wood Memorial Hall, Newcastle-on-Tyne, on Feb. 9, Mr. G. B. Forster, M.A., in the chair, Mr. THOMAS E. CANDLER read a paper "On a Description of Thompson's Patent Centrifugal Pulveriser, including an account of its comparative advantages for crushing and pulverising mineral ores, coal, and other substances." In referring to mining generally the author briefly pointed out the defects adherent to stamping machinery, and went on to show that until recently no suitable pulveriser had been invented which would overcome the disadvantages found in stamps for the effectual and economical crushing of mineral ores and other tenacious substances.

It was explained that in Thompson's mill quite a new departure had been made by the introduction of centrifugal force for this purpose, and that the machine designed on this principle had given excellent results in crushing and pulverising substances of the hardest character, while doing equally well in softer substances. The crushing power is solely acquired by the centrifugal force imparted to a hammered steel ball by its being propelled by a pair of flexible discs around the inner periphery of a steel shoe-ring, the substance being crushed between the ball and the shoe-ring. This seems to be the only way in which centrifugal force can be successfully applied, for it is very necessary that the ball should have a perfectly free and rolling motion, and should expose all its surface for useful work. The mill in its structure is very simple, and has few working parts, and the wearing parts consist only of the ball shoe-ring and disc.

Two extraordinary features in this machine are the extreme fineness of the pulp and the output of the mill. It is stated that 75 per cent. of the pulverised material passes through the screens, with 10,000 holes to the square inch, and that only a very moderate-sized machine has an output of 60 tons in 24 hours. When one reflects that a battery of 20 stamps cannot approach this quantity, and that the ore crushed seldom passes through screens of more than 900 holes to the square inch, it is no exaggeration to say that a machine of such a character threatens to totally revolutionise the whole treatment of mineral ores.

Mr. Candler further adds that it was assumed in many of the Indian gold mines that the quartz was allowed to escape before being sufficiently reduced, and consequently screens with from 2000 to 3500 holes to the square inch were sent out to remedy this defect, but on these being applied not 10 per cent. of the original output could be maintained, and they consequently were discarded. It is only natural to suppose, from what has already been heard of these mines that a machine, such as Thompson's, would not only have given better results in the treatment of the various reefs there, but would probably have enabled the question of the existence or non-existence of workable gold to have been more conclusively settled.

INFLUENCE OF GEOLOGY ON BRITISH SCENERY.—No. II.

In his second lecture on this subject Dr. GEIKIE said that a true mountain-chain is the result of a local plication of the earth's crust, and its external form, in spite sometimes of stupendous erosion, bears a close relation to the outline impressed on the area by the original uplift. Tried by this standard, hardly any of the heights of Britain deserve the name of mountains. With some important exceptions, as in the South of Ireland, they have been carved by erosion out of upheaved masses of land of unknown form. Their individuality of form has been determined by geological structure and composition. As regards age, the oldest British mountains are those of Archean rock in the outer Hebrides and north-west of Scotland. The Welsh mountains may be grouped under two types—that of Snowdon, where the prominence of the ground has been produced by the presence of vast masses of durable volcanic rock which have resisted the degradation that has lowered the surrounding regions; and that of the Breconshire Beacons, which are obviously merely the relics of a once extensive tableland.

The mountainous area of the Lake District presents some of the most interesting problems in the evolution of topography. The remarkable radiations of its valleys and lakes has been attributed to a system of divergent fractures. But examination shows that no such fractures exist, and that, on the contrary, the valleys run quite independently of the geological structure of the ground. We are forced to the conclusion that their features have been determined when the Lake District lay buried under a deep covering of carboniferous, and, perhaps later, rocks. This covering being eventually ridged up into a dome-shaped eminence, the earliest drainage diverged from its summit, and the streams thus determined have held their course ever since, gradually cutting through the covering, and then eroding deeply into the underlying more ancient rocks. The mantle of carboniferous limestone, coal measures, &c., has been entirely stripped off, and the rugged contours of the mountains have been gradually sculptured by the agents of erosion out of the exposed mass of underlying rocks.

The Scottish Highlands were likewise in large measure buried under later accumulations, and their characteristic outlines have been produced by erosion, guided and modified by geological structure and composition. The Irish mountains are grouped around the great central plain, and may be attributed to at least three periods. Those of the north-west and south-east are a continuation of the heights of Scotland and Wales. Those of Kerry and Cork are the most typical mountains in Britain, being true local uplifts. They form long, lofty ridges, and have undergone vast denudation, the depth of rock removed from their summits being in some cases probably not less than 12,000 ft. The Mourne Mountains may be classed with the conical heights of Skye and Mull. Of British tablelands, the great central plain of Ireland is the most striking and interesting. It has been formed by the stripping off of some 3000 ft. or 4000 ft. of carboniferous strata, leaving an undulating eroded surface of the underlying limestone. The moors and wolds of Yorkshire present a fragment of a tableland of nearly horizontal Jurassic and cretaceous rocks. The Lammermuirs and Scottish Highlands must also be regarded as tablelands in various stages of destruction. The fate of tablelands is to be cut down into systems of valleys, with intervening gradually diminishing ridges. Some of the earlier stages of this destructive process may be seen in the youngest British tableland—

that of the Basaltic region that extends from the south of Antrim through the inner Hebrides.

FOREIGN MINES.

AKANKOO.—J. Lane, Jan. 11: No. 1 tunnel has been driven a total distance from mouth of 545 ft., and should in about a month if all goes well cut the roof which outcrops on the north side of Ponsonby Hill. The drive west from No. 1 tunnel is in 58 ft., and the drive east from ditto is in 13 ft. The first stope west from the Taylor shaft has been driven 13 ft. The drive west from No. 2 adit is in 17 ft., and the drive east from ditto is in 23 ft.; the rock in all the drives preserves the same general character as before. The frame of the mill-house is up and all riveted together, it is roofed in and the overhead traveller is in place. The carpenters are busy with the timber-work. The trench for supplying water for the stampers is nearly complete, and the short tunnel—about 40 ft. long—to connect same with sump under Mill-House Hill is being actively prosecuted. The slip for steam-launch and lighter is nearly completed, when we shall be able to overhaul and repair them.

BARANCANNES.—J. Garland, Feb. 6: Notwithstanding the hardness of the rock we made very good progress in sinking the engine-shaft last month, 3½ fms. having been sunk, making a total depth from surface of 25½ fms. We expect to communicate with the cross-cut and bottom level this month. The cross-cut south-east from the old 24 shaft was extended 4½ metres and driving suspended, the end being now under the shaft. The men completed this work yesterday, and will be put to rise towards the shaft forthwith. Not to impede this more important work stoning has been suspended till the communication has been effected. The erection of the dressing machinery has been somewhat delayed through waiting for its arrival from Lisbon. It was only last week that we received the first instalment of jiggling machinery. Tangye's steam pump, &c., and a portion of it is still delayed. The crusher is almost ready to work and a hoist and train-incline is being put up to wind the reserve orestuff to the crusher. We hope to get well on with the jiggers this month, and to have all ready to make a start dressing next month. The winding-engine is well nigh completed, but the mechanics are just now devoting all their time to the dressing machinery.

BELT COPPER.—A. Brand, Jan. 21: My last report was dated Jan. 7, since then I have to report as follows:—Champion rise in No. 2 shaft still shows the same as on 7th inst. The drift which was stopping in the shaft is now stopping the back of the adit level and producing good stamp work. I am getting a track in the adit and putting in a stull from the stope between adit and No. 1 shaft, so as to facilitate the hoisting of trade from rise. No. 1 level east shows good stamp work and some small barrel work. In the stope between the first and second level I have put in a stull at the back of second level, so that we can stop without interfering with our trammings.—No. 2 Level East: A horse trap has come into the vein, and the level looks very poor at present. The crossing I referred to in my last appears to have heaved the vein.—No. 1 Shaft: We are still hoisting from below second level, and the trade is as good as I expected it would be. No. 2 level west looks well in stamp rock, with a few pieces of barrel work. We have cut a small stream of water, which seems to be increasing, but I do not apprehend any trouble from it. Our steam pump is now being removed to the drift under No. 1 shaft in second level. This will be safer and better than where it was. Knowlton shaft has continued to show good stamp rock, and some little barrel work. This morning the vein seems to be dipping sharper than it was.—Knowlton Level East: We drove the cross-cut to the foot-wall showing the vein to be 19 feet 6 inches wide, and the same throughout. We are now pushing the level on the same course as before.—Wolsley: This shaft looks well, and is turning out good stamp rock.—Mill: The trussel work will be finished by this day week, and the mill start on Wednesday, the 30th, unless something unforeseen takes place. In hoisting the rock from the main bins to the small pockets behind the mill I found it would cost a great deal of belting and be inconvenient. In order to obviate this I have borrowed a small engine from a neighbouring mine (the Evergreen), which will suit the purpose. Rock house is now boarded in and shingled. The saw mill is running steadily cutting timber for the rock house, &c. We have now out about 400 cords of 2 ft. wood for the locomotive, leaving another 100 cords to come. I have only contracted for 2500 cords of wood for the different engines so far. Nothing further to report.

BRATBERG COPPER.—John Daw, Z. W. Daw, Feb. 9: In the 25, driving west of Murchison shaft, the lode is 3 ft. wide, producing 13½ worth of ore per fathom; this end is within 3 or 4 fms. of holeing to York's. The five stopes working in the back and bottom of this level are worth on an average 12½ per fathom. In Daw's shaft sinking below the No. 3 adit the lode is 4 ft. wide, and will yield 13½ worth of ore per fathom. In the end driving west of this shaft the lode is 3 ft. wide, worth 10½ per fathom. We have three stope working here worth 12½ per fathom each. In No. 3 adit driving west the lode wall showing the vein to be 19 feet 6 inches wide, and the same throughout. We are now pushing the level on the same course as before.—Wolsley: This shaft looks well, and is turning out good stamp rock.—Mill: The trussel work will be finished by this day week, and the mill start on Wednesday, the 30th, unless something unforeseen takes place. In hoisting the rock from the main bins to the small pockets behind the mill I found it would cost a great deal of belting and be inconvenient. In order to obviate this I have borrowed a small engine from a neighbouring mine (the Evergreen), which will suit the purpose. Rock house is now boarded in and shingled. The saw mill is running steadily cutting timber for the rock house, &c. We have now out about 400 cords of 2 ft. wood for the locomotive, leaving another 100 cords to come. I have only contracted for 2500 cords of wood for the different engines so far. Nothing further to report.

BRATSBERG COPPER.—John Daw, Z. W. Daw, Feb. 9: In the 25, driving west of Murchison shaft, the lode is 3 ft. wide, producing 13½ worth of ore per fathom; this end is within 3 or 4 fms. of holeing to York's. The five stope working in the back and bottom of this level are worth on an average 12½ per fathom. In Daw's shaft sinking below the No. 3 adit the lode is 4 ft. wide, and will yield 13½ worth of ore per fathom. In the end driving west of this shaft the lode is 3 ft. wide, worth 10½ per fathom. We have three stope working here worth 12½ per fathom each. All our machinery is working satisfactorily. The dressing is going on regularly. We have drained the water out of York's, and are now engaged in fixing skip-road. The new drawing-engine to draw from will be ready to start early in March.

CALIFORNIA GOLD.—Alfred Rickard, Jan. 19: At the shaft good progress is being made with the excavation for the reservoir below the 1500 ft. level and sinking will be put in operation in the first days of February at the latest. The 1500 ft. level east is in 140 ft.; lode 1½ ft. wide, yielding 3½ tons of fair grade milling ore per fathom. The stope of this level are very steady in their out-set of 6 tons per fathom. During the past week the ore is of higher grade than usual. The 1500 ft. level west is in 154 ft., and is in a fine run of ore; it has increased to a width of 6 ft., and the mill returns are of an average of over 12 dwts. per ton; the yield is fully 15 tons per fathom. The stope of this level are in good ground, yielding 7 tons of milling ore per fathom. The 1400 ft. east is yielding 7 tons of milling ore per fathom, and a little smelting ore. The 1400 ft. west is in 386 ft.; the stope are improving in their yield.

Feb. 14: Telegram: Mill run 496 tons; yield, 1200f.; smelting ore sales, 200.

CALLAO BIS GOLD.—G. Voldeler, Jan. 8: I am very much pleased to state that the branch of quartz discovered in drift is still more assuring of a close proximity of the Callao lode. The branch is now getting wider reaching to 3 ft. I am sinking on this discovery as reported.

CANADIAN COPPER.—Francis Bennetts, Jan. 31: Hartford Mine: The stope at the mine are looking well, and with the exception that we have a promising leader of ore about 2 ft. wide in the bottom of the 50, east of No. 5 shaft, there is no new feature of importance to report. The smelting works continue to run well, and make fair quantities of regulus.

CHILE GOLD.—A. H. Nicholson, Jan. 8: Monthly Report for December: The No. 4 shaft (Cenicero) is now 45 ft. from bench mark, 8 ft. 6 in. having been sunk during this month. The lode in this shaft is 3 ft. wide, and is very good milling quartz. No. 8 level west is 46 ft. from bench mark; 11 ft. have been driven during this month. The lode in this drift is 10 ft. wide, and is also good milling quartz. No. 8 level east is 143 ft. from bench mark; driven this month 13 ft. The lode is 3 ft. wide, and is a little broken up. The No. 8 stope, east of bench mark, is 5 ft. 6 in.; during this month 15 ft. has been stopped. The lode is 4 ft. wide, and of good milling quartz. Nothing has been done in the No. 7½ level east since last report. No. 6½ level, east of bench mark, is 143 ft.; driven during the month 8 ft. There has been a little improvement in the appearance of the lode in this drift since last report. No. 5½ stope in the back of the level east of bench mark is 43 ft. 6 in.; 20 ft. has been stopped this month. The lode is 3 ft. 6 in. wide, and is of fair milling quartz. No. 4½ stope east from bench mark is 140 ft.; stopping done this month 21 ft. The lode is 3 ft. 6 in. wide, also of fair milling quartz. No. 3 level east is 93 ft. from bench mark; during this month 11 ft. has been driven. The lode in this drift is 2 ft. wide, and of fair milling quartz. No. 2 high back, west from bench mark, is 47 ft.; 12 ft. has been stopped this month. Nothing has been done towards stopping upwards since last report. The timber in the mine is in good condition, and the pump is working satisfactorily.

Quarts: On hand last month, 90 tons; broken during month, 1611 tons; total, 1701 tons. Trammed to mill, 1596 tons; on hand Dec. 31, 105 tons; total, 1701 tons.—No. 1 (Water) Shaft:

in the mill. Ore shipments for past fortnight:—213 sacks of coked ore, weighing 9 tons 1515 lbs.; 23 sacks of screenings, 1740 lbs.—10 tons 1255 lbs.
DENVER GOLD.—Alfred Rickard, Jan. 23: In my letter of the 15th ult. I described the progress made up to that date, and the improved prospects before the company, and I am pleased to be able to say that there is a further improvement still, especially with the discoveries at the 900, and the improved condition of the stoping ground at the 1275. We are now in position to run 40 stamps with a full supply of ore for the next three months, and we only await the intersection of the lode at the 900, with the discovery of a good bunch of ore there, to place us on a more permanent footing for a profitable output. The 1350 is of much greater promise than for a long time past, and we consider it likely that this will soon come into a shoot of ore. All round the prospects have improved, and it will soon become necessary to consider new places of operation for the development of the various ore bodies now showing up so favourably.

DENVER GOLD.—F. S. Craven, Jan. 24: The 800 drift in north vein is very poor, but all the stopes are very good. The cross-cut is not yet through. We shall have an accurate survey of the ground shortly. The 900 west drift keeps passing through very changing ground, but may be said to pay all the time. The raised stopes are good, and carry considerable smelting ore. We have 10 tons of this on top ready to ship; 10 tons of the 800 west smelting ore were shipped last week. The 1275 west and bottom workings have not changed. The 1350 is of much greater promise than for a long time past, and we consider it likely that this will soon come into a shoot of ore. All round the prospects have improved, and it will soon become necessary to consider new places of operation for the development of the various ore bodies now showing up so favourably.

DEVALA MOYAR GOLD.—Mine Manager, Jan. 21: At Strathern reef, in the southern drive, we have started to cross-cut. There is no change in the driving north. At Salomon's reef the tunnel has been driven 12 ft. for the week. The shaft is down 54 ft., with a fair prospect of gold in it. I am now crushing a sample of 40 tons from the old raise up, and when that is finished I will mill 40 tons from the shaft we are now sinking. Harewood Tunnel has been driven 8 ft. during the past fortnight.

EBERHARDT.—Frank Drake, Jan. 19: The drift No. 9, from the 6000 west has advanced 8 ft., making a total length of 750 ft. This drift is looking better than the week previous. We have made assays of three samples taken from the face of the drift on the 13th, 16th, and 17th, which we find in silver \$470, \$2481, and \$345 respectively. The ledge matter is about 1 ft. wide. The lime-rock lying next to the ledge is not so much stratified, and we think our wall will soon begin all right. The No. 2 rise has advanced 7 ft., making the total height 207 ft.; this work is principally in spar. The wall continues with us very regularly; there has been but a very little variation in its angle—not greater than 5°. Its present angle is about 75°. We have a small seam of ore in our working in the side of No. 1 drift, what we find is of good grade. Our last assay was \$157.08 in silver. If this seam would enlarge it would be very pleasing to me, as doubtless it would to the company.

HORNACHOS SILVER-LEAD.—Report for January: Main shaft has been sunk 4 metres. No time has been lost except for repairing and protecting the cistern and pump. Better progress is expected to be made this month.—Sixth Level: The north drift has been advanced 8'30 metres; the lode is 1½ ft. wide, and yields 8 cwt.s. of silver ore, value 12z. to 13z. per fathom. The same level south was driven 8'20 metres, the lode being more mixed, but yielding 4 cwt.s. of silver ore, value 6z. per fathom. Fifth level has been driven north 11'65 metres; the lode yields 3 cwt.s. of ore, value 12z. to 13z. per fathom, and the same level south has been extended 8 metres, yielding 4 cwt.s. of ore; value 6z. per fm. The stopes in the north drift at this level have improved, and are valued at 6 cwt.s. of silver ore; value 9z. 10s. per square fathom. In the third level the drift south advanced 9'30 metres, giving 4 cwt.s. value 6z. per fathom. The cross-cut in the north drift at this level was driven 6'50 metres; the lode is not yet intersected, but some veins of quartz are met with. Drift south in first level extended 10'4 metres, producing nothing but a little blonde. North shaft sunk 9'13 metres; lode still unproductive, though there is ore visible at times.

HOOVER HILL GOLD.—Jan. 29: In the drift we are running under the tunnel stop at a depth from surface of 135 ft., we have encountered a stringer of a few inches of ore carrying a little gold, the tunnel ore body pinched out completely in the bottom of the stop at a depth of about 100 ft. from surface, and gave no signs of continuing in depth; the drift at 135 ft. has been driven under it to prove the ground. This (the Hawkins') part of the mine has been, and is, costing us a great deal of money, and has latterly been yielding very little ore, so that I have been considering the advisability of cutting down expenses in this part of the mine. We are now following ore indications at four points, and driving a cross-cut through dead ground at a fifth. In the course of a month I shall be better able to judge as to the best thing to do. By putting another pair of men to stop in the Gallimore, we could keep the mill supplied with ore of about the same grade as we are crushing, and at the same time not break ore faster than we are opening it up. The proportion of pay-roll belonging to the Hawkins' part of the mine amounts to about one-third of the whole. In the Gallimore we have about four months' supply for mill in sight. The Brios shoot (which we are working in the Gallimore) has, so far, from the 130 down to the bottom of the shaft at a little over 200 ft, proved very regular. It extends about 60 ft. along the course of the vein, and averages about 18 in. in thickness, although in the bottom of the shaft it is about 3 ft. thick. From the nature of the vein, a considerable amount of slate has to be broken and milled with the ore, as the general character is that of a network of stringers going through the hard slate. The ore, as we break it now, without picking, mixed with a considerable proportion of slate, yields us from 5 to 10 dwt.s. per ton in the mill. It is a question how far by picking we could increase the grade of ore. We have already made a trial in that direction, but without decisive results. We found that there was not so much slate as might be expected that had no stringers of quartz running through it, and hence apt to carry gold. We discontinued the practice chiefly because we found that in washing and picking the ore at the surface, rich specimens, which sometimes occur, were carried off by the pickers and others. We purpose making another trial. By continuing the work now in progress in the Gallimore and Brio's shaft, should the vein in the bottom of the Gallimore continue as it now is, and the ground between the bottom of the Brio's shaft and the back of the drift, south-west from the Gallimore at 130, turn out as I expect, we shall in about six months' time have from eight months' to a year's supply of ore for the mill opened out ahead.

JAYALL.—G. E. Chambers, Jan. 5: I beg to hand you the following report of the past month's working:—Mine: Dolores stoppe was driven 6'3 vars west. Nispero stoppe No. 1 was driven 4'5-6ths vars east, and a cross-cut made north and south to discover width of lode. I have now placed a small tram down here, and shall commence formally to stope away the ground; the lode is extremely wide. I also made a rise of 4½ vars in the western ground. From Nispero stoppe No. 2, 57 tons of quartz were extracted from the western side, and 14 tons from the eastern. In Nispero No. 3 a rise of 9 vars was made, and a cross-cut to north to communicate with Nispero stoppe No. 4. Pim's tunnel was driven 2 vars, ground even harder than before; but to-day a streak of better-looking quartz has appeared in the end, which shows gold to about 2 or 3 dwt.s. I feel certain that we shall very soon come into good quartz. Sinking No. 1, under Socorro, was driven 5½ vars to the west, quartz improving all the time; about 5 vars ahead I expect to be under the commencement of the rich Socorro vein. Sinking No. 2 was completed to the depth of No. 1 (21½ vars), and I shall this month commence driving a level east to meet sinking No. 1; the intervening distance is about 120 vars long, so that as I intend to stope right down to the depth of 21 vars, we shall have quartz for some time, roughly calculated at about 10,000 tons. San Pedro stoppe No. 1 yielded 78 tons of quartz. San Pedro No. 2 was driven 9½ vars to east, and yielded 31 tons of quartz. Laken stoppe gave 132 tons of quartz. From Letrina stoppe I brought down 77 tons to the mill; but have temporarily left this place, the quartz being very hard and the quality poor in comparison with other parts of the mine. The new rise to surface between Laken and new shafts being completed, I have commenced to stope away on the surface, where very fair quality quartz has been encountered. The total number of cubic vars extracted from the different stopes, interior and surface, including those already mentioned, was 710, and from the Manto workings 135 cubic vars. You will see by the mill return that the general average value of the quartz has increased to 6 dwt.s. 4½ grs. per ton, this is extraordinarily good; the whole of the mine in its various workings has improved in appearance, and I have every hope of continuing to report a good average value.

Mills.—La Fe: Under this head I have to give you the important and gratifying news of the success of the turbine recently sent out. Soon after the mail left in December the water-power fell off, first to 20 stamps and then to below 15. I then decided to stop entirely, and put on the Red Hand turbine. This was on the 17th, as besides the actual placing of the turbine, I had many other repairs and alterations to do. I anticipated having to spend at least 10 or 12 days in the completion, but by dividing and using all the labour, and by offering various small premiums, I had the satisfaction of seeing the work completed and the mill put to work again by the 23rd. Amongst the numerous repairs, I entirely rebuilt the water-tank, repaired and replanned one of the waste-gates, took away an objectionable corner in the water-course, thoroughly cleaned the whole of the water-course, re-levelled the main shaft and re-caulked all the bearings, put down two new copper plates and re-laid the other old ones; took away the ground behind the stamps to facilitate the damping of the quartz, and at the same time to give more room for storing, and many small repairs. To refer back to the turbine, I am happy to say it proves to be immensely superior to the faulty machine we previously had in the shape of a shield's turbine, and only takes about two-thirds the quantity of water to drive all 30 stamps, two settlers, and the crusher. Of what I see at present I have no fear whatever of ever having to stop stamps in the wet season through scarcity of water-power. In the dry months we shall also be able to use nearly all the stamps, except, of course, in March, April, and May; but even then we may be able to run sufficient stamps to render it more economical to dispense with the engine. In April and May I have great doubts of there being sufficient water for more than five stamps. Of course the experience of the coming dry season will prove this, but I shall prepare firewood for those two months to be on the safe side. I must congratulate the company upon having acquired the efficient machine, and I feel certain that brighter days are now before us, both for decrease in expenditure and increase in gold. The 30 stamps worked 16.9-24.6 days, crushing 1354 tons of quartz, which yielded 387½ ozs. of gold, making an average of 5 dwt.s. 17 grs. per ton. We are still working all the 30 stamps merrily, and as this month I anticipate no stoppage for more than pay-day, I feel myself justified in promising you another good remittance next month.

La Esperanza: The eight stamps worked 18 days, crushing 320 tons of quartz, which yielded 95½ ozs. of gold, making an average of 5 dwt.s. 22 grs. per ton. La Caridad: The two arrastras worked 7 days, and yielded 36½ ozs. of gold; the result here this time is better, which is chiefly due to my having employed the men during the stoppages on the other mills to dig up sand from the old tailings race. Total remittance consists of 519 ozs., and the average yield upon total tonnage is 6 dwt.s. 4½ grs. per ton. I think you will agree with me in considering this the best remittance. I have ever made you considering the short time of working.—Receipts and Expenditure: The expenditure was \$597, the remittance I value at 1300. I congratulate the company upon so favourable a commencement of 1884, and sincerely hope for a continuance of good fortune.

KOHINOOR AND DONALDSON CONSOLIDATED.—Mr. Alfred Rickard, manager, in his report for the two weeks ending Jan. 15, says:—Donaldson: At the No. 1 level, the vein is 1 ft. wide, yielding 1½ ton per fathom, which is all milling ore. The No. 2 level stope north of rise is yielding ½ ton of smelting and 3 tons of milling ore per fathom; the lode on the length of the stope will average 2 ft. in width, 4 in. smelting ore of good grade, the balance being mill ore. The ground and yield in the same stope south of rise is of a similar character to the foregoing. At the bottom of the No. 2 level stoping ground is being discovered, the vein being 14 in. wide of fair grade. The intermediate level south stope is yielding 1½ ton of smelting and 3½ tons of milling ore per fathom; the lode is strongly mineralized, and the work is preparing paying ground for the mill. The intermediate level north stope is yielding ½ ton of smelting and 2 tons of milling ore per fathom; the vein is about 15 in. wide, and

of fair grade. At the Champion the 600 west stopes are yielding 2 tons smelting and 7 tons of milling ore per fathom; the lode is large, carrying mineral throughout. The tributaries have connected the 400 east stopes with the 440 by rise, giving good ventilation and facilities for extending the stope in the bottom of the level; the grade of the ore is fairly maintained. The work in the mill is now reduced to the smaller finings. A few days only will be required to cut and fix the belts, water and steam pipes, and to splice the wire-ropes, and put on the buckets for the tramway. To sum up, we foresee the disbanding of the staff engaged on the construction about the 28th of the month (i.e., January). The output in smelting ore for the month of December amounted to \$3000, and several hundred tons were added to the stocks of milling ore.

Mr. Rickard telegraphed the directors on the 9th inst. as follows:—Mill cannot be supplied before 15th. Tramway automatic action must be assisted. Am fixing gear.

PESTARENA UNITED.—W. Roberts, H. P. Clemes, Feb. 2: District of Pestarena: The 33 end, north on No. 5 lode, shows a better defined lode in stratified schist, yielding 4 tons per fathom at 5 dwt.s. per ton. The 65 south continues in hard rock and without change. The 90 north carries two good walls and a regular lode, yielding 2 tons per fathom at 10 dwt.s. The 110, south on No. 1 lode, is in micaceous schist with a small branch of pyrites against the hanging-wall, yielding stones of good quality ore. The 130 north is producing 3 tons per fathom at 9 dwt.s.; the rock is stiff and of a mixed character. In the 130 south the ground is much easier, carrying a small quartz lode mixed with pyrites, giving 2 tons per fathom at 7 dwt.s. The 160 cross-cut west towards No. 5 lode progresses satisfactorily. In the incline shaft below the 130 the lode is widening and of a dredgy nature; the part being carried is about 1 metre wide, and the western wall has not yet been reached. The present yield is 8 tons per fathom at 8 dwt.s. per ton.—New Work: A drift in south end of stope over 90 is being extended in a big lode, which promises to open good stoping ground, and is now yielding 12 tons per fathom at 12 dwt.s. In the stope over the 110 level a drift has been taken up on a branch in the eastern side of a similar bearing to that of the No. 2 lode, and is giving 3 tons to the fathom at 18 dwt.s. per ton. A cross-cut to be driven eastward from the 120 south will be commenced after the stuff in the level is cleared. We are making the trials with the jiggling machinery referred to in our last, but the time has been too short to allow of a definite opinion to be formed as to its probable success. Owing to the scarcity of water we have reduced the working number of mills to 14, and there is grave reason to fear that we shall shortly be compelled to still further reduce our milling power. The speed is hoisting is also greatly retarded. We have not yet commenced the transport of millstone and timber from want of snow.—Val Toppa: W. Roberts, H. J. Gifford: In the end south on new lode and slide at No. 1 level the western branch is seen to be a sort of flat bed dipping to the west, but terminating upwards in the level. It shows a good quantity of nice looking pyrites and the present yield is estimated at 6 tons per fathom at 1 oz. per ton. The eastern branch has lately been opened out also, and seems to be the regular continuation of the new lode, for now that the ground is no longer broken and disordered as at the junction it is clear that this lode is above the side. It is yielding at the rate of 10 tons per fathom at 8 dwt.s. per ton. The lode in the rise above the No. 1 level is giving 12 tons per fathom at 9 dwt.s. Though much smaller than formerly it makes against the hanging-wall, and now gives greater promise of continuance. The cross-cut east from winze under the level is passing through genial rock with small strings of quartz. The end driving south on branch east of new lode at No. 1 level shows a good strong lode with a plentiful admixture of pyrites and every appearance of continuation both in back and bottom, now yielding 15 tons per fathom at 10 dwt.s. per ton.

PITANGUI GOLD.—The agents (Rio de Janeiro, Feb. 9) state that the produce for January was 1000 oits. of gold, worth, at \$3. 6d. per oit., 425.

RHODES REEF GOLD.—Feb. 14: The directors believe that their colleague, Mr. Carnegy, must have now reached the mines. The manager reports, under date Jan. 21 that he has nothing fresh to communicate.

RICHMOND CONSOLIDATED.—Cablegram from Eureka, Nevada: Week's run (one furnace), \$11,000 from 269 tons of ore; refinery, \$15,000.

RUBY AND DUNDERBERG CONSOLIDATED.—Jan. 23: Dunderberg: There are 20 tributaries at work, and have shipped 16 tons ore this week.—Home Ticket: The mine was closed down on 17th inst., consequently, there is little or no change since my last. The miners who were at work have all refused to continue to work on the terms offered. We have advertised for others to take their place. Whether we will be successful or not I am not prepared to say. Have shipped 92 tons ore this week.—Lord Byron: The cross-cut from the end of the tunnel has been advanced 5 ft. during the week; total 477½ ft. Griggs' and Co.'s cross-cut has been advanced 7 ft. during the week, and is now connected with the Valentine shaft; total, 63 ft.

—Telegram, Feb. 12: 24 tons ore shipped, and 24 tons smelted realising net \$442. Snow has blocked the road for nearly the whole week.

ST. JOHN DEL REY.—Telegram from Morro Velho dated Rio de Janeiro, Feb. 11: Produces for month of January 17,500 oits.; value, 6781L; yield, 3½ cts. per ton.—Cuiaba: 1100 tons stamped (word doubtful); yield, 1½ ozs. per ton.

UNITED MEXICAN.—Mr. Hay, Jan. 14: Mine of San Cayetano de la Ovejera: In the frento No. 2 of Santa Rosa west the lode is a little broader, measuring 85 centimetres, and the small improvement of the ore continues. In the contracielo No. 2 of Santa Rosa the ore is good on a breadth 50 centimetres, the size of the vein. In the frento No. 1 of San Juan west the end has a better appearance than lately, and at the end of last week we discovered a very narrow strip of ore 3 centimetres broad. To the bajo of the lode another strip of quartz has appeared, but without silver, and from its reliz a small quantity of water is oozing. In the frento No. 2 of San Juan west appearances of ore have begun to appear in this end. In frento No. 2 of San Juan east the lode again is narrower, measuring only 175 metres in breadth, of which 53 centimetres are in ore of a very good class. In frento No. 3 of San Juan west the strip, measuring 30 centimetres, continues to give fair ore. In frento No. 3 of San Juan east the lode is still 160 metres broad, but as the ore is ramified, its product is but small. In pozo No. 3 of San Juan the costa to the bajo we worked on has diminished in value. On 5th inst. in pozo No. 4 of San Juan the lode measures now 145 metres, but this 45 centimetres are of a better quality. In the pozo No. 5 of San Juan the strip continues to give good ore on a breadth of 40 centimetres, but this winze will soon hole in the third frento of San Juan west. In pozo No. 6 of San Juan this winze has held in frento No. 2 of San Juan east, and by this communication the whole of the lower workings of San Juan are well ventilated, as they were very hot before the communication was achieved. We could not take out the attle that had been thrown down in them, but now we clean them out to enable us to go on sinking the winze. In the frento No. 9 of San Andres west, the lode continues to show good appearances but nothing more.

In the cross-cut from pozo No. 2 of San Andres having reached the lower wall we have driven in frento No. 10 of San Andres' west; in this end the ore goes on well, the lode measures 160 metres in width, of which 45 centimetres of good ore seem to improve downwards. We have not yet found any ore in the pozo of San Antenor, but we continue to see good appearances. The sale in reserve was about 321½ cargs.—\$4000. We introduced at Duran 315 cargs and 2 cargs 3 arrobas and 11 lbs. of bonito were sold, making a total extraction of 639 cargas hacenda ore. The men who carry out the ore on their backs struck again, and refused to work Monday and Tuesday, but on Wednesday went underground, having received extra pay. In the frento of San Martin slight traces of silver continue to be perceived in the strip of ore-looking stuff we work on. As I said in my last report the rails are laid down, but we have yet to clear out the rubbish that has been thrown down in the rectification and levelling of the road. We expect to have done with it at the end of this or beginning of next week. Returns from the mine of San Cayetano de la Ovejera for the week ending Jan. 12, \$6546.99; outlay, \$3030.

Feb. 13: (Cablegram): The excess of returns over outlay in the mine of San Cayetano de la Ovejera for the week ending Feb. 9 is \$300.

THE POTOSI GOLD MINING COMPANY.

The directors of this company have received letters from Mr. T. B. Provost, dated Peru Jan. 12, 1884, in which he says:—

Attwood's Shaft: In my last I stated we thought of starting a level west at about 80 ft. from surface, but on thoroughly examining the side of the shaft at this point the ground was somewhat broken, so we decided to go 20 ft. lower. This we have done, and started a level west at about 100 ft. from surface, which we shall call the No. 1 level. We have driven 8 ft.; the lode is well defined, fully 5 ft. wide; looks well for an early improvement, more dark veins appearing in the quartz, all of which is taken to the mill. We purpose continuing this level west. Next week we shall start another level about 60 feet below this, which we shall call No. 2, drive them both as quickly as possible, and open up a stopping ground. In about a month we shall be able to raise 30 tons per diem from this shaft; all the quartz taken out will give us at least 1 oz. per ton in the mill. This will more than pay the working expenses here, and I shall be much surprised if the next few months do not open up much richer ore. Within 100 ft. of this shaft there is a line of old workings from the surface more than 200 ft. long. Everybody says they were rich and had to be abandoned solely on account of influx of water. We have erected a temporary hoist and platform at surface, by which we can hoist at least 35 tons per day in the course of a few months. As the mine gets developed we shall have to put in skip-road, ore-bin, and derrick, and the lode that the quartz can be dropped from the skip into the wagon and taken direct to the mill; the ore-bin to be used in case of accident to the mill or tramway, as I much prefer the broken ore to be deposited at surface rather than leaving it underground.

Air-Shaft:—We have only sunk 4 ft. since my last, all the men being employed in putting in the necessary timber to start driving and preparing the shaft for the main hoisting-shaft. The large derrick is completed, sheave fixed, also the turn pulleys from the hoisting-engine and the shaft timbered level with the mill tramway. The men are to-day fixing ladder, collar, and skip-road; all being well by the 16th the work will be completed and two levels started, one east and one west from the bottom of the shaft. We shall also continue sinking this shaft, I hope, in February. I have strong hopes that early in April we shall have sufficient quartz from this shaft alone to keep 20 stamps continuously at work.

<p

WATSON BROTHERS: MINING CIRCULAR.

WATSON BROTHERS,
MINERS, STOCK AND SHARE DEALERS, &c
1, ST MICHAEL'S ALLEY, CORNHILL, LONDON

We received many communications on the same subject that "X" writes upon, but had not time to notice them last week. There can be no doubt whatever that the present depressed state of the mining market has been brought about mainly by the system adopted by some people in advertising prices. In former times those connected with mining did all in their power to support it, as we have continued to do, but the system pursued by some of the advertisers disgusted *bona fide* holders, and brought many mines to grief. The public buy in rising markets as a rule, and avoid those which seem to be constantly failing, and by some advertisers nothing was allowed to rise for long.

A discovery might be made in a mine and the prices of shares might rise—say, for the sake of argument—to 17 per share. An advertiser not having a share in the mine nor even one share *bona fide* for sale might advertise 100 shares at 19s. If he got an applicant and sold 100 shares at this price he would be a "bear" of them, and his interest would then be, by every means in his power on the market and by advertising them at still lower figures, to get down the price, and if he succeeded in getting them down to 15s, by account day his profit would be 4s. per share, or 20*l.* Yet wonder was often expressed to see mines improving, and yet quotations for shares going down daily! Of course there are *bona fide* advertisers as well as others—those who have the shares really for sale, and sell and deliver them. We only refer to part of a system that we know has been extensively adopted, and which it is also well known to the mining community has more than anything else brought about the present position of affairs in *bona fide* mining speculations.

We think, therefore, the resolution adopted by all parties not to advertise prices at all is an excellent one, and will result in a better tone to the market and bring in more buyers. All we want for old producing mines is a better price for metals, and for young and promising speculations one or two good discoveries.

If the negotiations which have been going on for some months at Parys and Mona result in success, we believe the amalgamated mines would form one of the finest properties ever offered to the public, irrespective of mining. This is the opinion of those well qualified to judge, and we understand meetings will shortly be held to lay the present positions of affairs before the shareholders. The delay has not arisen on the part of the directors of either mine.

The Commissioners of Woods and Forests are not content with dead rents and heavy royalties, but they insert a clause in their leases—that "the Crown shall be entitled to one-fourth part of any consideration, or of the value in money of any consideration, to which the lessee may become entitled in his assigning or otherwise disposing of or dealing with the property. That is to say, if A, B, or C take a lease at a royalty of 1-12*th* and a dead-rent merging in royalty, and they make a discovery upon which they can sell the mine or their interest in it for 10,000*l.*, the Crown come down upon them for 2500*l.*

The points in operation at Wheal Crebor having further improved to 62 tons per fathom as the aggregate for copper ore and 6 tons of mundic.

We are in expectation of a good discovery at West Crebor before long, but do not like to say much about it at present, having so frequently been disappointed.

A Shareholder (West Kitty) we can only answer privately.

On the Stock Exchange the tone is decidedly firmer, and prices generally show some improvement, the only important exception being in Mexican railway stocks, which have further declined; the traffic receipts continue to show heavy decreases; the ordinary stock has been down to 44*l.*, being a fall of 100*l.* per cent. since the corresponding period of last year. Grand Trunk stocks are all considerably higher, the last traffic return giving a good increase, the Second and Third Preference have risen 3*to* 4 per cent. English railways were dull at the opening of the week, but close decidedly firmer, Brighton, A. stock showing a rise of over 3 per cent. American railways are all better, and it is generally thought that the lowest prices in these stocks have been seen. Foreign stocks are steady. Egyptians have been dull, but close better. Among miscellaneous securities Brush shares are better. Indian rubber shares are 4*l.* down on the unsatisfactory dividend. The English funds are firm.

FROM MR. JOHN B. REYNOLDS.—The political outlook is so threatening that capitalists are naturally cautious in their movements. It is to be regretted that so much is made of incidents, important no doubt, but which cannot impede the onward march of events. The order of the day is "progress." Fresh openings for trade are being secured, and business men have no anxiety for the future. It appears to us that strong evidence of the satisfactory state of trade is to be found in our railway traffic returns. Recently there has appeared to be a slight check; but all rapid progress is succeeded every now and then by a certain amount of reaction.

The reaction which we have had will only be followed by further improvement. The progress of our rails and banks is splendid. The metal trade, however, is also of paramount importance to this country, and, considering the quietude of business and the supply of tin, it is remarkable that this metal is only about 10*l.* per ton below the average of the last 30 years. And it is stated that the supplies from the Straits must fail off; if this be so, Cornishmen will not have long to wait for 7*l.* per ton again for their produce. The future most certainly is anticipated with confidence; if not, who can account for the high prices which our dividend mines still command, and the eagerness evinced to obtain good properties in paying localities? Low-priced shares in progressive mines are in good demand, especially in cases where the management is on the most approved principles. The St. Agnes mines, including East Blue Hills, Wheal Coates, Polherro, and others find favour. Considerable attention is being concentrated upon Polherro, and this is natural, seeing the singular resemblance of this mine to West Kitty and Wheal Kitty. Now, inasmuch as a good mine is good for everybody, let all rejoice in every success, and endeavour to prevent failure in every possible way. West Polherro and Wheal Coates meetings will be held next week; no doubt they will be full of interest. Shareholders should muster in good force. At Wheal Coates such is the improvement in financial position that no call is expected.

NEW YORK METAL EXCHANGE MARKET REPORT.—Jan. 26: Iron has again been dull but steady all week, closing nominal. For the early part of the week tin was feverish and declining, but has since recovered, closing rather firm, though quiet on the delay of cable advices. Copper has been little more than nominal all week, closing unchanged. The total sales are about 20,000*l.* tons. Lead after opening dull but steady, became suddenly weak, and as of 25*l.* tons were made at from 4*l.* c. down to 4*l.*; closes very much depressed. Spelter has been utterly featureless, and at the close shows no revival, although the tone is fairly steady. Feb. 1: Iron steady, closing firm. After second call \$20 bid for December. Tin easier; sale were:—Our first call 10 tons Straits, Feb. 1, at \$19-20; on first call 10 tons Straits, Feb. 1, at \$18-30; between 10 tons Straits, March, at \$18*l.* Copper steady. Lead dull. Spelter nominal. Average prices, Feb. 1, 1883.—No 1 pig iron, spot, \$24 bid, \$25 asked; Straits (tin, spot, \$25*l.*) asked, futures, \$21 asked; Luke copper, spot, \$18*l.* asked, futures, \$19*l.* Baltic, spot, \$17 asked, futures, \$17*l.* domestic lead, \$18*l.* With regard to the domestic markets the report from Philadelphia Jan. 31 states:—Pig-Iron: Business drags a little, and while the prices are unchanged the feeling is less buoyant than it was, and buyers less inclined to make bids except for small lots. Steel Mills: Market quiet and steady. In manufactured iron there is more business doing, and prospects are favourable for a steady demand, but prices are weak, and on the whole average lower than before the holidays. Chances of improvement not encouraging for the near future, as competition is very sharp. Old rails steady.

"DR. LOCOCKE'S PULMONIC WAFERS I have always found give relief in the distressing attacks of asthmatic coughs, and in the progressive stages of consumption." (Signed) J. Spence, M.P.S., 225, Great Colmore-street, Birmingham. They instantly relieve and rapidly cure asthma, consumption, bronchitis, coughs, colds, shortness of breath, phlegm, pains in the chest, rheumatism—and all its pleasurable. Soli: 1*l.* 1*12*d. and 2*l.* 9*d.* per box by all druggists.

HOLLOWAY'S OINTMENT AND PILLS.—Rheumatism and rheumatic gout are the most dreaded of all diseases, because their victims know that they are safe at no season, and at no age secure. Holloway's ointment, after fomentation of the painful parts, gives greater relief than any other application; but it must be diligently used to obtain this desirable result. It has been highly commended by rheumatic subjects of all ages and of both sexes, for rendering their attack less frequent and less vigorous, and for depressing the sour perspirations and soothing the nerves. In many cases Holloway's ointment and pills have proved the greatest blessings in removing rheumatism and rheumatic gout which had assailed persons previously and at prime of life.

THE OURO PRETO GOLD MINES OF BRAZIL (LIMITED).
THE LIST of APPLICATIONS for SHARES will CLOSE on FRIDAY NEXT, the 22nd inst.

53,400 SHARES OF £5 EACH ARE OFFERED FOR SUBSCRIPTION.

THE OURO PRETO GOLD MINES OF BRAZIL (LIMITED).

DIRECTORS.

M. ALEXANDRE ELLISSEN, 41, Boulevard Haussmann, Paris.
Le Marquis de FALETANS, Chateau de Faletans, Jura, France.
JOHN TAYLOR, Esq., 6, Queen Street Place, London, E.C.
RICHARD WARD, Esq., 21, Onslow Square, London, S.W.

* Will join the board after Allotment.

MANAGERS—JOHN TAYLOR and SONS.

OFFICES—6, QUEEN STREET PLACE, LONDON, E.C.

Prospectus may be obtained, together with forms of application for Shares, at the offices of the company.

THE OURO PRETO GOLD MINES OF BRAZIL (LIMITED).

Since the prospectus was issued advices have been received from the manager on the spot, announcing a new remittance of gold of 3100 oitavas, valued at about £140*l.* He states that the mines look well, and that large reserves of ore are accumulating in the Passagem workings.

Mining Correspondence.

BRITISH MINES.

BEDFORD UNITED.—H. Trease, Feb. 12: We have not yet intersected any lode in the cross-cut at the 115 west, but are hoping to find something daily. In the 103 west the lode is worth 6*l.* per fathom, or 2 tons of ore. The tribute department on this lode is about what it has been for some time past. At McCallum's engine shaft we have had several drawbacks of late owing to breakages in connection with the drawing-shaft, the wind-bore and H-piece having been broken in the course of blasting. In the 62 west the lode is 2 ft. wide, of a promising character, composed of capel, mundic, and ore. The stopes behind the end is worth 6*l.* per fathom, or 2 tons of ore. In the 62 east the lode is promising. The stope behind the end is worth 7*l.* per fathom, or 2 tons of ore. In the 42 east the lode is strong and masterly in appearance, and producing saving work for ore and mundic. No. 1 stope at this level is worth 20*l.* per fathom, or 8 tons of ore. No. 2 stope is worth 9*l.* per fathom, or 2*1*/_{2 tons ore. The tribute pitches are yielding a fair quantity of ore. I estimate to sample next time about 200 tons of ore.}

BWLCH UNITED.—W. Northey, Feb. 14: I have decided to employ four men to costean and open on the lode at surface, where we may fairly expect to cut it rich in silver-lead ore in a few days. There has been no change worthy of remark in any point throughout the mine since my last advice. The machinery is in good order.

CARN CAMBORNE.—W. C. Vivian, Feb. 14: I have to inform you that in the 105 east the lode has been greatly reduced in size by a sudden turn in the direction of the granite wall on the south, but I hope that it will, on our driving further, resume the good size and excellent character which it had when I wrote you last. The same level west is without change. In the winze sinking under the 95 we continue to meet with copper ore of good quality associated with common spar, and the appearances indicate further improvement. In the 40 west the north lode is without alteration worthy of particular notice.

CASHWELL.—John Peart, Feb. 9: The two headings in copper hazle west end are looking a little better, as we get more into the sill; the rise we made from the drift in the vein to the top of this stratum did not give us a favourable impression. But the way the headings are opening out is more encouraging, in places we have good ore, and in other places only poor; but so far as pried we will average 1 ton of lead ore per fathom. The drift in copper hazle east is still hard and very little vein. In the rise in slate hazle east end there is a fine vein, but as yet not very much ore.

COED-Y-FEDW AND PANT-Y-BUARTH.—R. Prince, Feb. 14: The 90 west is worth 3*l.* per fathom. In the roof the lode is worth 1 to 1*1*/_{2 tons per fathom and the 1*1*/₂ tons per fathom. Trevethan's string, 1*1*/₂ tons per fathom. The 1*1*/₂ tons, driving to the Cefn-Beechan lode, is very hard, but indications to day are favourable.}

D'ERESBY MOUNTAIN.—J. Roberts, Wm. Sandoe, Feb. 13: There is more

lead in the shaft from surface than has been seen since we commenced sinking, and as there is a good mixture of lead and blende in the rise at No. 4 there is reason to expect that it will continue till we get through. The shaft at No. 4 is looking a little better for lead. The rise at No. 5 is much the same in value and appearance as for some weeks past.

DEVON FRIENDSHIP.—F. R. W. Daw, W. Gill, Feb. 14: The ground in the adit end, west of Kent's shaft, is a little easier for driving. At this point we are driving on a branch which is making towards Kent's main lode in a north-western direction. We expect next month to cut Kent's main lode, which all hope will prove productive for copper ore as it did east of the cross-cut. All the points on Bennett's lode are without change since we reported to you last week.

DEVON GREAT CONSOLS.—Isaac Richards, Feb. 10: Wheal Josiah: The casing and dividing the Count-house shaft from the 14*l.* to the 180 has been completed, and the men are now engaged cutting off top plat preparatory to deeper sinking below the 180.—Wheat Emma, Inclined Shaft: In Granfield's rise in the back of the 137 east, the lode is from 4 to 5 ft. wide, and 1 ton of copper ore and 2 tons of mundic per fathom.—New Shaft, New South Lode: In the 20*l.* east the lode continues without any important alteration, yielding 1 ton of copper ore and 4 tons of mundic per fathom.—Railway Shaft: In the Railway shaft, sinking below the 20*l.*, the ground is scarcely so favourable for exploration. In the 180 east, on the south part of the lode, the lode is from 2 to 3 ft. wide, and yields small quantities of copper and mundic ores.—Waterman: The engine-shaft having reached a sufficient depth for another level 112, the men are now engaged casing and dividing the shaft from the 10*l.* to this the 112, preparatory to driving east and west on the course of the lode, and judging from the appearance of the lode at the deepest point reached, and also for several fathoms above, where it is worth 3 tons of copper and mundic ores per fathom, we expect to lay open some good productive and profitable ground at these levels are extended in these directions. There is no important alteration at any other points of operation throughout the mines.

DEVON GREAT UNITED.—Isaac Richards, Feb. 14: In the 120, east of Willesford's shaft, the drivage is being carried for more speedy progress by the aid of the 20*l.* adit, west of engine-shaft, has communicated with the great Gunnis, and we had now good ventilation here. We have put the men to sink a winze in bottom of said level, against the rise coming up in back of the 40. The rise in back of the 90, west of engine-shaft, is being pushed on as vigorously, and we expect to complete the work in about a month from this time, when we shall have a good piece of tribute ground laid open at this point. All our pitches and bargains are yielding their usual quantity tinstuff, and every effort is being made to increase the returns, but we cannot expect to do so to any extent until after we have completed the following work now in hand—rise in back of 90, rise in back of 80, and rise in back of 40 to shallow adit.

EAST BLUE HILLS.—S. Bennetts, W. K. Mitchell, Feb. 13: On Monday the miners succeeded in reaching the end of Gumpay's adit south towards the White Kitty lode, and find it extended 140 fms. south of the Pink lode towards the former. The level is driven on a small cross-course in a soft white killas. There is now new feature to notice in the sinking of the shaft below the adit. One of the stopes on the north part of the lode has become exhausted; the other three are just the same as last reported, and worth in the aggregate 20*l.* per fm.

EAST CARADON.—W. George, J. Kelly, Feb. 14: The 130 cross-cut is being continued with satisfactory progress, and is reset to six men, at 9*l.* per fathom. During the past month we have had some patches of elvan similar to that found in the adjoining mine, and from the present character of the ground we consider there is a probability of our being near another lode.—South Lode: In the western drive from rise in back of the 70 the lode is 1*1*/₂ tons per fathom, composed of good quality copper ore, with a good deal of mundic and peach; reset at 4*l.* per fathom. In driving east from same rise the lode has not been fully taken down, but when cut into near the end we broke some very good stones of ore; this is also very promising, and is reset at 5*l.* per fathom. There are three stope pitches; set to six men, at 13*l.* 4*d.* in 1*l.*

EAST LONG RAKE.—H. B. Vercoe, T. Davies, Feb. 11: Since my last report we have commenced driving the 40 north from rise on the new north and south lode; it already improves, the ground becoming softer, lode larger, and producing more lead. It looks as if we are going to open out an entirely new mine in this direction, the lode being entirely un-worked beneath the old men's workings. In the 40 driving west on the middle lode the ground has caused a little, and the lode produces occasional lumps of ore. This end whether productive or not must be pushed on to the new lode for the purpose of ventilation. The late heavy rains have increased the water in the mine considerably, but so far have not prevented working in the bottom level.

GAWTON.—Geo. Howe, Feb. 9: The lode in the 117 east has improved within the past week, and looking exceedingly kindly, mixed wth sulphur and arsenical mundic, and yielding 1 ton of copper ore per fathom. No. 1 stope, in the back of the 117 east, is yielding 5 tons of mundic and ore per fathom. No. 2 stope, in the back of this level, is yielding 3 tons of mundic per fathom. The lode in the stope in bottom of the 105 east is yielding 7 tons of mundic per fm. The lode in the rise in the back of the 95 east is 2 feet wide, and yielding 5 tons of mundic and ore per fathom. The stopes in the back of the 82 east and west of cross-cut, are yielding 3 tons of mundic per fathom. We have commenced to drive the 70 west, on the south part of the lode, which is showing a very promising appearance, and yielding fully 6 tons of mundic per fathom. No. 1 and 2 stope, in the back of the 70 east, are yielding 10 tons of mundic per fathom. We hope to ship on Monday next 50 tons of prime arsenical ore.

GORSEDD AND MERLYNN.—W. T. Harris, Feb. 14: In the 70 east the lode continues to increase in width and productivity, and promises well; the ground is rather easier for progress. The pitch west is yielding lead in paying quantities.

GREAT HOLWAY.—W. T. Harris, Feb. 14: Roskell's Shaft: In the 85 north we have intersected several branches of spar mixed with lead; clear evidence that the lode is in close proximity, and when discovered there is no doubt it will be found rich.—Level Engine-Shaft: No. 1 pitch in the back of the 80 east is producing 10 ewts. of lead and 1 ton of blende per fathom. The same value will apply to No. 2 pitch in the back. In the rise in the back of the 60 east the ground is more cherty, and contains a little lead. No. 1 pitch maintains the value last reported—1*1*/₂ tons lead and 1*1*/₂ tons of blende per fathom. No. 2 pitch is yielding 5 tons of lead and 1*1*/₂ tons of blende per fathom. No. 3 pitch is worth 15 ewts. of lead and 1*1*/₂ tons of blende per fathom. No. 4 pitch has slightly improved, now

worth 1 ton of lead and 1*1*/₂ tons of blende per fathom. No. 10 pitch in the back of the level is yielding 2 tons of lead and 1*1*/₂ tons of blende per fathom.—Olifica Shaft: In the 60 east the pitch in the back is producing 10 ewts. of lead and 1*1*/₂ tons of blende per fathom. No change in any other point to-day. We have sampled 15 tons of blende, and to-morrow shall sell 40 tons of lead ore of superior quality.

GREAT LAXEY.—F. Redcliffe, Feb. 13: The lode in the 247 end north is of more encouraging appearance than for some time past, and it is much to be hoped that it may now have a run of better ground; the present value is 1*1*/₂ tons per fathom. The short cross-cut at the 247, north of engine-shaft, is driven through the lode, which proves to be of no value at that point, and the driving is now being directed north upon its course. The 235 end north is now in a large hole consisting almost entirely of spar, precisely the same as in the end driven south from Dumbell's shaft towards it, and from which it is now but a few fathoms distant. The winze in the 130 north is holed to the 145, and the men placed to stop from the top of the winze, where the lode is not very good to start with, but will soon get down to a richer lode.—Dumbell's: There is an improvement in the 230 end, it being worth at present 20

NEW CARADON.—N. Richards, Feb. 13: We are not as yet through the choke in the engine-shaft, which is now down about 15 fms. below surface, and we hope to reach the 20 in about four weeks from this time. We have suspended the driving west on Kitto's lode for the present, or until we reach the 20, as it will cause some hindrance in drawing the stuff, &c. The machinery and pitwork are working well.

NEW WEST CARADON.—N. Richards, Feb. 13: In the 38 cross-cut we are opening out both east and west on the last lode cut, which is about 1 ft. wide, and has a very kindly appearance, producing a little copper ore; but it is unsettled, being so near the cross-course. Nor do we expect to get any improvement until we get away from the influence of the same. Between this and No. 5 lode we have passed two branches, one of them about 7 in. wide and ore to be seen in each of them, one of which, I think, will unite with the last lode cut, as this level is extended east. No. 5 lode maintains the same kindly appearance, producing a little rich copper, but not sufficient to value.

NORTH BLUE HILLS.—S. Bennetts, Feb. 13: The north lode in the adit west varies in width from a few inches to 1 ft., without much alteration in its composition.

NORTH GREEN HURTH.—J. Polglase, Feb. 7: The deep cross-cut is not letting out so much water as last week, the appearances are much the same. The vein in south end from deep level is very regular in the back of the level, which is in haze. No change in the new ground.

NORTH PENSTRUTHAL.—S. Davey, Wm. Polkinghorne, Feb. 14: Good progress is being made in sinking Highburrow shaft below the 150. The lode in the 150 east end is larger as we leave the elevan, and also improving in appearance for the production of tin. The other points are in character and composition as last reported.

NORTH TRESKERBY.—Pryor and Son, Feb. 14: The men driving the deep adit cross-cut north of Scorrer Consols engine-shaft are making better progress; the end is still letting out a quantity of water, and the ground continues to be strongly mineralised. No. 2 lode driving west of this cross-cut is improving, and is now worth 17 per fathom, and No. 1 lode, east of cross-cut, is worth 19 per fathom. From these points we have this day drawn to surface another splendid pile of rich thinstone. The men sinking Jabez's shaft are also making good progress, and we believe that the communication will be effected to the deep adit level within the time before stated. The severity of the weather during the past week has much improved our surface operations, but we are pleased to state it is again favourable, and we are pushing the work with all possible speed. The winding-engines are completed, and should the weather continue fine, in about a week or 10 days the mason-work will be in course for them. All other work is being carried on as fast as possible.

OKEF TOR.—H. Bulford, J. Hodda, Feb. 14: The part of the lode carried in driving the 90 east is looking more promising, and the ground is moderately easy. There is nothing fresh in the cross-cut south at this level, but from the nature of the ground, which is carrying strings of spar and mundic, we think we are near the intermediate lodes. The cutting of the tip-plate at the 90 is progressing favourably, and the lode is very large, producing good stones of copper ore and tin, and is otherwise looking exceedingly promising. The winze in the bottom of the 90 is being continued by the side of the lode.

PANDORA.—W. H. Borlase, Feb. 14: The 45 fm. level is looking very promising, and is at present producing saving work for lead and blende. I have taken the men from No. 2 stopes, and am pushing the dravage of this end as fast as possible. No. 1 stope, in the back of this level, is worth 2½ tons of lead per fathom. The winze sinking below the 33, on Goddard's lode, is looking well, and is worth 3½ tons of lead and blende per fathom. The tribute pitches are looking just the same as for some time past. Owing to the incessant wind and rain we have not been able to get on with our outside work to rods, &c., but today we have had very fine weather, and with a continuation of such for a day or two we shall complete the job. The advantage of every fine hour is being taken.

POLROSE.—W. Bennetts, Feb. 14: In the past week we have made good progress in driving the 122 east, where the lode is still about 3 ft. wide, composed of peat, spar, and a little mundic, with tin throughout, and occasionally rich stones of tin. The lode in this level has a better composition, and produced more tin than in any of the upper levels, and there is good reason to expect further improvement. We have not yet cut the lode in the western cross-cut, but are daily expecting to do so.

PRINCE OF WALES.—S. Roberts, Feb. 13: In the 102 east the men are now engaged clearing the level of stile, in order to take down the lode, which, as far as can be seen, has a very promising appearance. The men in the 102 west are still stopping the back near the end; lode maintains its large size, worth 3 tons of copper ore per fathom, and fair stamping work for tin. The lode in the 90 end east is looking much better, being now 4 ft. wide, worth 2 tons of rich copper ore per fathom. The lode in the 90 west is also improving in value and appearance, 4 ft. wide, worth 3 tons of copper ore per fathom, and usual value for tin. All other points in operation are without any change to notice since last reported.

ROMAN GRAVELS.—Arthur Waters and Son, Feb. 14: The 125, south of new engine-shaft, shows a lode 5½ ft. wide, worth 1 ton of lead ore per fathom. The 110 south is in a lode 3½ ft. wide, worth 4½ tons of lead ore per fathom. The lode in the 95 south is 2½ ft. wide, producing 2 tons per fathom, and improving. The lode in the 80 south is 4 ft. wide, and worth 4 tons per fathom. The lode in the 80, north of old engine-shaft, is at present 2 ft. wide, and producing good stones of lead ore. The stopes are producing the quantities of ore stated in recent reports. We have to-day sold 250 tons of lead ore for 1767½ lbs.

RUSSELL UNITED.—John Bray, Feb. 14: The men at Matthew's shaft are busily engaged fixing the lift in the cistern about 14 fms. below the 97, and doing all necessary work to commence sinking this shaft as fast as possible. Nothing new at Stephen's engine-shaft.

SINCLAIR LEAD AND BLEND.—W. T. Harris, Feb. 14: Waco Shaft: The 69 level south—the great improvement reported last week is maintained. Some splendid stones of lead have been taken out, and the ground in every respect indicates an early and further discovery. All other points throughout the mine without change calling for remark.

SOUTH CONDUBROW.—William Rich, William Williams, Humphrey King, Feb. 13: We have holed the winze below the 80, east of King's shaft, and have begun to stop east of the same, where the lode is worth 12½ per fathom. The 80, east end, east is worth 7½ per fathom, and the ground easy for working. The 80, east, west of Plantation shaft, is yielding saving work for tin. The ground is favourable for driving in the 80 cross-cut north going towards the copper lode. The lode in the winze below the 70 west is worth 8½ per fathom. The 70 end, east of King's, is worth 5½ per fathom. The stop in the back of this level is worth 12½ per fathom. The 60 end east is worth 12½ per fathom, and the stop in the back is worth 12½ per fathom. The 50 end east is worth 12½ per fathom, and the stop in the back is worth 12½ per fathom. The 40 end east is worth 6½ per fathom, and is in a strong and kindly looking lode. The 30 end west is unproductive. The 20 end east is worth 7½ per fathom. Two stopes in the back are worth 10½ and 15½ per fathom respectively. We have suspended the 42 end, west of Marshall's shaft; the lode has entered the killas or slate-rock, and is unproductive. The ends driving west of this shaft are not very productive at present, but the stopes and pitches are yielding fairly well.

SOUTH DARBEN.—John Mitchell, Feb. 14: In the 130 end east we have stripped down the lode, which is large, and worth 1½ ton of silver-lead ore per fathom. We have not made much progress in driving this end this week, as we have had several breakages in the shaft, and have had the men timbering the 40 and the 70. The 130 west has improved a little since last report; the lode is larger, and worth about 1½ ton silver-lead ore per fathom. There is no particular change in the stopes or tribute pitches. A full report on all places will be sent you next week. All work is being pushed on as fast as possible. The 45 tons of silver-lead ore sold on the 5th inst. realised 514½ lbs.

SOUTH DEVON UNITED.—W. Hooper, Feb. 14: The lode in Martin's shaft continues of a most promising nature, being 5 to 6 ft. wide, and worth fully 25¢ per fathom, with every indication of further improving; the ground continues very favourable for sinking, and good progress is being made. By the end of another week we hope to be down the required depth for another level, when we shall commence without delay east and west on the course of the lode, and from present indications no doubt valuable ground will be laid open. The lode in the adit level, west of old sump lode, is of much the same character as for some time past, yielding beautiful goosan, fluor-spar, with stones of good quality copper ore. I am also pleased to inform you we have set three tribute pitches. One pitch in the back of the 75, west of Brook engine-shaft, to two men for two months, at 13s. 4d. in 12. One pitch in the back of the 80, east of Brook engine-shaft, to three men, for two months, at 12s. 4d. in 12. One pitch in the back of the 90, east of Brook engine-shaft, to three men, for two months, at 13s. 4d. in 12.

SOUTH FRANCIS.—C. Craze, Feb. 12: There is no change in the value of the lode in Pascue's shaft; lode worth 35¢ per fathom for 12 fms. long. The same remark as to change will apply to the two bottom levels; in fact, since our last report a pair of rod plates broke near the adit at Marriot's, and several pins, &c., in the 104 fm. level, which have been the means of throwing in a little water in the bottom of the mine and prevented our doing much there; however, we are all right again now, and hope to be in fork again some time to-morrow. The 225 west is being driven by boring machine, the lode in which for the last 6 ft. driven has improved in appearance and value, now worth 10½ per fathom, and looks kindly to further improve. A winze in the bottom of this level is going down in a masterly lode, which is worth 35¢ per fathom for 12 ft. long. No. 1 stope is worth 22½ per fathom, and No. 4 stope is worth 14½ per fathom. A winze sinking below the 225 east is worth 24½ per fathom for 12 ft. long. In the cross-cut at the 205 east we are nearing the lode, and in a week more expect to be fully into it, when we shall know its value. We have to-day broken some stones from the forebreast, which contain about 20 lbs. of tin to the ton of stuff, which we consider a good indication. This end is being driven by boring machines. We are rising in the back of the 205 fm. level by boring machine on a lode worth 15½ per fathom for length of rise, 12 ft. A stope in the back of the 185 east is worth 14½ per fathom, and a stope in the bottom of this level is worth 14½ per fathom. No. 1 stope in the back of the 185 west is worth 15½ per fathom, and No. 2 stope is worth 14½ per fathom.—Marriot's shaft: The men are cutting down this shaft with fair speed. In Daubus's shaft we are driving the 58 north-west towards the lode, with good speed, and hope to cut it against our next meeting, and should we find it good we shall be able to open up a good mine in that part of the property specially. Since we hole 1 Marriot's shaft from the 185 to the 205 we have had our compressor put in thorough repair, and we are now driving three boring machines with it, whereas there were never more than two driven with it before. This is very important for the future opening out of the mine.

SOUTH KITTY (St. Agnes).—Feb. 14: The sinking of the new shaft is still being continued, and rich tin-stuff has been broken. We fully expect as we go down the lode will improve in size and value. The prospects on the New Kitty lode are still cheering. Additional men will be put on to open up this part of the mine, where we expect a junction of two lodes, and it is generally believed that a rich course of tin will be met with. We shall soon arrive at the conclusion where to sink the engine-shaft.

SOUTH PENSFTRUTHAL.—S. Davey, Feb. 14: Engine-Shaft: In the 114 fm. level cross-cut soith we have struck the cap of the lode, which will be got through as quickly as possible to ascertain size, character, and value, which I will forward by telegram or letter when accomplished. There is no special change to note in the flat-rod shaft sinking below the 150. The lode in the 150 east west is producing good stones of yellow copper, with occasional stones of tin.

TANKEVILLE GREAT CONSOLS.—Arthur Waters and Son, Feb. 14: Big Mine: The 21 pitches at work here by 65 men are together worth 6½ tons of ore (at tributes varying from 5½ to 8½ per ton) and 8 tons of blends per fathom

(at a tribute varying from 25s. to 30s. per ton). We have to-day sold 30 tons of lead ore for 203½ ss. and 40 tons of blends for 161½.—Pennerley Mine: Warm Water Lode: The rise and stope in the 125 west are each worth 20 cwt. per fm. The new shaft is down 4 fms. 2 ft. below the 22; lode at present worth 2 tons per fathom. The lode in the winze in the 93 west is 7 ft. wide, and worth 3 tons per fathom. The two stopes in back of the 93 west are together worth 4 tons per fathom. The winze in the 96 east of new shaft, is in a very wide lode, worth about 1½ ton of lead ore per fathom. The stope in back of said level is worth 20 cwt. per fathom.—Potter's Pit: In consequence of the very wet weather we have had late the water here has risen to the 105.—Tankerville: Main Lode: In the 244 east we have during the last few days been driving through a narrow part of the lode, and yesterday cut into a small cavity, which has let down the water from the winze in the 232. The lode in said bottom end east is 2 ft. wide, producing good grey stuff. The 244 west is in a lode 4 ft. wide, composed of carbonate of lime and quartz, worth 20 cwt. of lead ore per fathom. The stope (referred to above) in the 232 east is down 3½ fathoms; lode at present 4 ft. wide, worth 13½ tons per fathom. The lode in the 232 east is 5 ft. wide, worth 1½ to 2 tons per fathom. The two stopes in bottom of the 220 east are together worth 3½ tons per fathom.—North Lode: The stope in back of the 220 east is worth 1½ ton per fathom. The two pitches in bottom of the 192 west are together worth 2 tons per fathom. The two pitches in bottom of the 192 west are together worth 2 tons of lead ore and 1½ ton of blends per fathom.

WHEAL LUSKY.—W. Skewis, Feb. 14: The lode in the adit, west of cross-cut, is if anything a little larger and richer for copper ore.

Original Correspondence.

CORNISH MINING—OLD SHEPHERDS.

SIR,—Reporting on this property some time since, I made allusion to the great extent of unwrought ground within its limits, and mentioned the desirability of working the western and north portions by other companies or additional capital. The latter section is a portion of the once celebrated Wheal Rose, where they smelted their own lead and silver, from which the late Sir Christopher Hawkins profited 80,000*l.*, the whole of which was raised from the surface to the depth of 60 fms. only, which is about the depth of the adit or day level in the most famous mining districts of the county. In his pursuit of the hidden chambers of wealth the miner is led on through those shallow deposits to deeper developments; but in this case all hope of that success which now awaits the present company was cut off by the famous Chancery suit of the Bishop of Exeter and Sir Christopher Hawkins, and it has been in abeyance to the present; this batch of mineral compares favourably with the shallow deposits of the various other districts of Cornwall, which led to greater wealth on extended operations. A few analogous comparisons may not be out of place to refer to:—Wheal Basset on 2624*l.* profited 320,144*l.*, or 11,823 per cent.; Carn Brea profited 277,500*l.* on 15,000*l.* capital, or 1850 per cent.; North Roskear, 110,000*l.* on 700*l.* capital; Tresavean, 454,122*l.* on 3120*l.* outlay; Wheal Buller, 244,672*l.* profit on 1280*l.* outlay; North Basset, 85,300*l.* on no paid-up capital; West Basset, 200,000*l.* on 9000*l.* capital; United Mines, 482,800*l.* on 16,000*l.* capital; South Frances, 205,000*l.* on a capital of 9393*l.*; and at least a hundred other equally startling examples can be enumerated, all of which made mineral shallow and under same conditions as that presented at Old Shepherds.

The interest and profits of mining, continues Mr. Bawden, are not limited simply to dividends from products, but afford frequent and unexampled instances of greatly accumulated gains from rapid advances in market value of shares. Something of this kind may be set in with regard to Old Shepherds, seeing the shares are rapidly rising in market value, stimulated, likely, by the re-working of the north and western portions of the sett, combined with the near approach to the bottom of the south mine, where rich bunches of silver-lead are known to exist. I can remember, from long association with mining pursuits, a Devon Great Consols share, with 12*l.* paid selling for 800*l.* per 102*l.* share, and that within one year of its commencement; a Basset, 5*l.* paid, 800*l.* per share; a Buller, 5*l.* paid, 1000*l.* each; Tresavean, 31*l.* 10*s.* paid, 2700*l.* each; East Wheal Rose (close to Old Shepherds, showing same lodes), with 50*l.* paid, selling for 1750*l.* each; and analogy points to like results on the development of both the north and western sections of this mine. I therefore take it that Old Shepherds shares may be called cheap—proof of which is the enquiry for them by county people who understand this business, and have a general knowledge of the value of the property; but, whatever may be the result of the market value of the shares, no one can predict with certainty as to its expansion of yield and profits in the coming decade. **CHARLES BAWDEN**

St. Day, Scorrier, Feb. 13.

ANTHROPOLOGY.—Mr. Sydney B. J. Skertchly delivered his third lecture on Primitive Man, on Feb. 5, his subject being the Men of the River Drifts. It was quite impossible to understand the antiquity of man without a knowledge of the physiology of rivers. A river has a life, an anatomy, and physiology of a peculiar and interesting kind. As regards its direction we find the river deflected wherever a tributary enters, and the tributaries enter at greater and greater angles as they approach the mouth of the main stream. Then as to its motion—a river is a machine for producing uniform motion, and its bed is not an inclined plane, but a very subtle curve, which approaches a cycloid, and is of such a nature that uniform motion is very nearly attained. The Rhine steamers do not use more coal high up than low down the channel, showing the velocities are equal. A cross section of a river valley shows the sides to have a double curve, convex above, concave below. The reason is that the upper convex parts are the result of atmospheric denudation, and only the lower parts are due to river action. Where atmospheric action is wanting, as in rainless districts in America and Africa, the river merely saws a narrow chasm or canyon in the course of ages. The valleys of all rivers are larger than the present streams require, and the valley deposits are more massive and at higher levels than the present rivers could form. All these facts point to a difference of condition; to a time when the rivers were larger, and thus and by the fossil remains of which is the enquiry for them by county people who understand this business, and have a general knowledge of the value of the property; but, whatever may be the result of the market value of the shares, no one can predict with certainty as to its expansion of yield and profits in the coming decade.

The fourth lecture, on Tuesday, was on the People of the Caves. Caves, of course, are limited in their distribution by the rocks, chiefly limestones, in which they can alone be formed. In these cases the remains of man occur with the bones of extinct animals. We get not merely the stone tools such as occur in river drifts, but smaller weapons such as barbed harpoons, bone needles, ochre for painting the body, pyrites for obtaining fire, and so forth. They show us that the cave-men belonged to the savage hunting and fishing stage, and had neither domesticated animals nor cultivated plants. They were expert fishers and fowlers, and certainly were clothed in skins as the presence of needles, and a drawing of a glove on a piece of bone show. They seem to have had no care for their dead, for no authentic trace of burial is known. A few bones only are of certainty to be ascribed to these people, but we really are not yet in a position to determine their physical characters. Perhaps the most interesting fact about them is their art culture. Upon bone and stone, with no better tools than flint, they depicted hunting scenes and animals with a freedom, grace, and spirit, which the lecturer believes was lost to the world after until Greek times. In two cases man is shown, and in both he is naked. In one a peculiar stoop gives a very ape-like aspect. The play of the muscles is well given, and in one case a real landscape, representing a reindeer grazing amid herbage, has the animal drawn almost like a Landseer. Their earliest traces of art were compared with modern Eskimo art, to the triumph of the former.

THE STEAM-ENGINE MAKERS' SOCIETY.—The earliest of the annual reports issued by the Trades Union societies connected with the engineering branches of industry is that of the Steam-Engine Makers' Society, and in precision of information, with the broad and comprehensive treatment of trade matters generally to be found in the address sent out to the members by the present secretary (Mr. Swift), the report bears very favourable comparison with those issued some years back by the above society. This week the 59th annual report has been sent out to the members, and notwithstanding the fluctuations in trade during the past year the secretary is able to report successful working of the association. The fact, however, is not disguised that the results have not been so beneficial as the executive council anticipated or expected 12 months ago; but when they consider the rapid decline of trade that set in at the latter part of the year and the strain that was put upon their funds, it was matter for congratulation that they had a fair balance to the society's credit after all legal claims had been met. The present position of the society was all the more satisfactory when they considered the four years of seriously epressed trade, from 1877 to 1881, which

[FEB. 16, 1884.]

absorbed all their income, a great portion of their capital, and extra contributions in addition. Since 1881, however, it had been their duty to submit annually an improved cash account, and for 1883 they would safely say that, all things considered, their financial records were satisfactory.

TO THE METAL TRADE.

FOR COPPER, TIN LEAD, &c., apply to—
MESSRS. PELLY, BOYLE, AND CO.,
SWORN METAL BROKERS,
ALLHALLOWS CHAMBERS, LOMBARD STREET, LONDON.
(ESTABLISHED 1849.)

JOHN G EAST,
NEWCASTLE-ON-TYNE.

BROKER FOR THE SALE OF PIG-LEAD, LEAD ORES,
COPPER ORE, COBALT, MANGANESE, CARBONATE OF
BARYTES. ESTABLISHED 1866.

HENRY NUTT,
BIRMINGHAM,
PURCHASER OF

LEAD ASHES, LEAD SLAGS, SULPHATE OF LEAD, TIN
ASHES, TERNE ASHES, AND ALL REFUSE CON-
TAINING TIN AND LEAD.

LANDORE COPPER COMPANY,
COPPER SMELTERS AND REFINERS,
LANDORE, NEAR SWANSEA.

BRANDS:—BEST SELECTED INGOT, L.C.B.S.
TOUGH .. L.C.T.
do CAKE, L.C.C.

HENRY WIGGIN AND CO.,
(LATE EVANS AND ASKIN),

NICKEL AND COBALT REFINERS,
BIRMINGHAM.

The Mining Market: Prices of Metals, Ores, &c.

METAL MARKET—LONDON, FEB. 15, 1884.

	IRON.	£ s. d.	£ s. d.	TIN.	£ s. d.	£ s. d.
Pig, G.M., f.o.b., Clyde...	2 2 8	—	—	English, ingot, f.o.b. ...	87	0 0
Scotch, all No. 1 ...	2 3 5	—	—	" bars ...	88	0 0
Hans Welsh, f.o.b., Wales	5 5 0	—	—	" refined ...	89	0 0
" in London	5 15 0	—	—	Australian ...	82	10 0
" Stafford,	7 0 0	—	7 5 0	Bank ...	mom.	—
" in Tyne or Tees ...	5 2 6	—	—	Straits ...	82	10 0
Swedish, London ...	9 0 0	—	9 10 0	COPPER.		
Rails, Welsh, at works ...	5 5 0	—	—	Tough cake and ingot.	80	10 0
Sheets, Staff., in London	6 0 0	—	8 10 0	Best selected ...	62	0 0
Plates, ship, in London	8 5 0	—	8 10 0	Sheets and sheathing.	63	0 0
Hoops, Staff.,	6 15 0	—	7 10 0	Flat Bottoms ...	71	0 0
Nail rods, Staff., in Lon.	6 15 0	—	—	Wallaroo ...	65	10 0
STEEL.				Burra, or P.C.C. ...	65	0 0
English spring ...	12	0 0	15 0 0	Other brands ... nom.	63	10 0
cast ...	30	0 0	45 0 0	Chili, ham, g.o.b. ...	53	15 0
Swedish, keg ...	13	0 0	14 0 0	Flasks, 75 lbs., war. ...	5	2 8
fag, ham ...	13	10 0	14 10 0	PHOSPHOR BRONZE.		
Balls at works ...	4	2 6	4 5 0	Alloys I. and II. ...	£112	0 0
" Light, at works ...	5	17 6	6 0 0	" V. ...	118	0 0
LEAD.				" VI. and VII. ...	132	0 0
English, pig, common ...	12	0 0	—	XI., Duro A., Duro B. ...	110	0 0
" " L.B. ...	12	0 0	—	BRASS.		
" " W.B. ...	12	10 0	—	Wire ...	63 14	—
" sheet and bar ...	12	17 6	—	Tubes ...	83	—
" pipe ...	13	7 6	—	Sheets ...	7	—
" red ...	14	15 0	—	Yel. met. sheath. & sheets ...	53	6d.
" white ...	16	10 0	19 0 0	TIN-PLATES.	per box	
" patent shot ...	15	0 0	—	Charcoal, 1st quality ...	1	1 0 1
Spanish ...	11	12 6	—	" 2nd quality ...	0	12 0 1 0
NICKEL.				Coke, 1st quality ...	0	16 3 0 1 0
Metal per cwt. ...	—	—	—	" 2nd quality ...	0	15 3 0 1 0
Ore 10 percent. per ton. ...	—	—	—	Black ...	per ton	15 10 0
SPelter.				Canada, Staff., or Gla. ...	12	0 0
Silesian, ordinary brands ...	10	0 0	14 15 0	" Liverpool ...	450	0
special brands. 15	0 0	—	Black Taggers, 450	0	—	
English Swans ...	15	15 0	—	14 x 10	30	0 0
Sheet zinc ...	18	10 0	19 0 0			

* At the works, 1s. to 1s. 6d. per box less for ordinary; 10s. per ton less for Canada; 1X. 6s. per box more than 10s. quoted above, and add 6s. for each X. Terne-plates 2s. per box below tin-plates of similar brands.

REMARKS.—This week there has been more steadiness in our markets, and taking them all round there has not been so much cause for dissatisfaction. It is true there are still very many features which require to be removed before a general recovery ensues, but at the same time here and there symptoms of a hardening tendency have made themselves visible. The disposition to follow up any little rise that may have arisen has not been very great, nevertheless the slightest signs of an improvement at a time like the present, when trade is so very dull and monotonous, are more than usually appreciated. Out of many other features which are viewed at the present time with anxiety is the question of finance. Lately the value of money has been stiffening, and last week a rise was effected in the Bank rate; but notwithstanding this money may still be reported cheap, and it is fortunate that it is so, for up to the present it has had little effect in crippling or injuring business. The anxiety, however, that exists in regards the future. Here we do not intend to fathom the probabilities of an advance in money, nor will we express any opinion as to the chances of a further rise in the value of money or not, but merely see what effect an advance would have upon the metal market. In the first place it would have the same influence upon metals as on general trade, that of checking enterprise. Fresh and important schemes would not, and perhaps could not, be entered upon, because they invariably require more or less financial assistance; thus a check would be placed upon any extra demand or new outlet for metals. This in itself would be a matter of regret, especially with the large and constantly-growing increase in the production of almost all metals, but then arises the problem as to whether this would be the full extent of the evil, or would the unfavourable influence extend to the ordinary demand—that is, the regular demand which the trade has been accustomed to. In all probability it would. Such a vast amount of the business both for consumption and shipment can only be transacted with financial aid, that it is not requisite to look far into the matter to see that dearer money would rapidly make a deep impression upon the trade.

It would vastly tend to restrict business, to reduce the already low limits of buyers, and most likely cause prices to recede, for not only would there be greater competition for such orders as might be offering upon the market; but also the extra rates of discount to be paid in order to secure the successful finance, for the execution of the orders would in reality, though, perhaps, not apparently, have to be met by sellers making greater concessions in price. So far, therefore, we have seen what the probable effect of dearer money would be upon the regular trade, it will doubtless be interesting while treating with the subject to discover its likely influence upon speculative business. At times when genuine trade is depressed the markets are kept lively and animated by the action of operators, and thus intense depression is sometimes warded off; but dear money would doubtless have the same influence upon speculative as upon ordinary business. Higher rates would have to be paid to effect loans, which would induce many holders to press sales, and particularly so if prices were to recede, as under such circumstances they doubtless would, for the margins would have to be kept up and extra capital provided. It is, therefore, to be hoped in the interests of the trade that money will not further advance in value. At the present rate there is nothing in it to interfere with the full development of trade, but any further rise might lead to difficulties which would probably create a serious shock to the markets in their present sensitive condition.

COPPER.—As regards prices there has been a rather better market for copper than during the past week, but the actual amount of business done has not materially increased. The manufactured trade is in a very satisfactory condition, and notwithstanding the easiness of prices the demand is in no way stimulated. This is one of the most adverse features in the market, and while smelters are rapidly working off old contracts fresh orders do not come forward, and the prospects of the trade are thereby somewhat dulled. With regard to the hardening tendency of Chill bars, the firmness has arisen from combined extra strength on the part of holders, and not from any augmentation in the amount of business transacted. It is a remarkable fact that generally just before the announcement of the Chill charters the value of Chillian produce becomes enhanced. It is clear that this does not arise from any extra amount of business doing just at that particular time of the month, and, therefore, to other causes the little improvement which usually takes place is to be attributed. It is, doubtless, occasioned by the efforts of holders who possess such a vast interest in the maintenance of the market. By slightly pushing up prices they give the market a start, so that in the event of the charters being announced as light the upward movement having once begun becomes easier to maintain, and thus still higher rates are more easily realized.

On the other hand, if heavy charters are advised, the little rise that is effected

just before their announcement is, perhaps, then, all that is lost; but, on the contrary, if no advance had been made, and heavy charters were telegraphed, it would almost of necessity intimidate weak holders into pressing sales, by which still greater reduced prices would have to be accepted. To this cause, perhaps, more than any other, is the stiffening tendency of the last few days to be attributed, and no importance is likely to be attached to it until it becomes more thoroughly pronounced. It scarcely seems, however, that the improvement is to be more thoroughly pronounced, for to-day a marked change for the worse has taken place; the market has been very gloomy, and the rise effected during the last few days has been entirely lost, and this notwithstanding that deliveries during the first half of the month have been very satisfactory, amounting to about 4000 tons. Confidence has been suddenly shaken, and at the close the appearance of the market is most discouraging, and decidedly points to reduced prices.

IRON.—The state of this trade remains very unsatisfactory, and no symptoms of improvement are as yet visible. Business is restricted in all its branches, and prices are kept low through a variety of causes. There are no fresh features of any importance to record, but those which have for a long time weighed heavily on the market seem to deaden the weight and increase the burden as time progresses. There is an utter want of confidence existing, and cheerfulness is noted only for its entire absence. We do at times read of an extensive business being transacted in Scotch pigs in Glasgow; but accompanying this the market is invariably reported flat, and generally prices are quoted lower, signifying very plainly that large and numerous as the transactions may be they are mere sales pressed upon the market; it may be in some instances by makers themselves, who, in order to keep their mills going and their forces in blast, are compelled to effect contracts, or it may be by holders wearied out by long and patient waiting at last determine to sell and cut their loss rather than run any further risk of a most uncertain future. The latter reason is, perhaps, the most probable and correct one, to which the constant reports of extensive business are to be attributed, but be that as it may, it is certain they do not arise from any extra amount of disposition to make purchases either for *bond fide* wants or speculative requirements. Recent "bear" sales may have to be covered in, but this does not cause more than the most temporary favourable influence, because there are numerous sellers only too anxious to satisfy the wants of such operators, and to secure any other orders that may be offered upon the market. The competition among sellers is, indeed, keen, and in consequence prices recede. Buyers apparently have it all their own way, and yet so bad is the general state of trade that few of them are ready and willing to satisfy more than their most pressing wants, a feature which in its turn has the effect of still further stimulating weak holders to press whatever iron they may have in hand upon the market.

At the opening of the Glasgow warrant market last Monday the tone was rather firmer, and transactions were reported between 42s. 7d. and 42s. 9d.; but on Tuesday the market was once more flat, and the price gave way to 42s. 6d. A slight change for the better, however, was perceptible on Wednesday, when a fair business was done between 42s. 7d. and 42s. 8d. Yesterday again the market was steady, and a moderate business was done between 42s. 9d. and 42s. 10d., and the closing figure this afternoon is 42s. 8d. The shipments last week were again small, and amounted to only 8900 tons, against 12,530 tons for the same week of last year, being a decrease of 3630 tons, and which makes the total shipments for the whole of this year 55,733 tons, against 63,854 tons for the same time of last year, and 57,695 tons for the similar period of 1882. The two furnaces which were damped down last week have again been put into blast, and the total once more stands at 97, while the public stock has been further increased by 932 tons, and now equals 592,338 tons, against 591,356 tons a week ago. The imports of Middlesborough pig iron into Grangemouth last week were 6880 tons, against 1920 tons for the same week of last year, being an increase of 5050 tons, and which makes a total increase for the whole of this year compared with last of 5039 tons. Business at Middlesborough continues very restricted, the quantity that is changing hands being most limited. Makers' quotation for No. 3 is 37s. for prompt delivery, and 6d. more for forward delivery in the course of next month. The price of No. 4 forge is 34s. 6d. to 35s., and war-wars are wholly neglected.

The public stock has been reduced by 200 tons, and amounts to 62,144 tons while the shipments last week were about 17,360 tons. The demand for manufactured keeps slack, and orders are being held in abeyance. The price of ship-plates is 52. 6d.; angles, 44. 15s. to 44. 17s. 6d.; and of bars, 52. 2s. 6d. per ton. The Wolverhampton market is not in a very healthy condition, and there is a good deal of competition amongst sellers, particularly for specifications of sheets. Prices, however, have not undergone much change, and the price of doubles is 54. 6d. to 54. 5s., and 94. 5s. for trebles, angles being quoted at 54. 17s. 6d. to 54. 1s.; gas strips, 54. 2s. 6d. to 54. 5s.; and certain Derbyshire pigs at 54. 3d. per ton. The Birmingham market keeps very inanimate, and there are but few enquiries for any class of iron, sellers keenly feeling the competition of Cleveland makers. For stamping sheets, however, there is a rather better demand, but in pigs there is next to nothing being transacted, and sellers have the greatest difficulty in upholding prices.

TIN.—During the past week the market for tin has been fairly strong, and at times slightly more disposition has been evinced to make purchases, nevertheless operators are still rather shy to follow up any rise, and consequently the market is not for long sustained. Little spurts every now and again occur to give animation to the market, and implant more strength to the tone, to make the tone more cheerful, and for the time being to establish more confidence as regards the future. Beyond this little better feeling which has existed more or less throughout the whole week, but which was chiefly noticeable on Tuesday last, there is nothing fresh to record. It may be that this little extra spirit of vitality is the fore-runner of better times and higher prices, but there is no fresh substantial feature to strengthen the views of the sanguine or to show that the minimum of the market has been touched.

The market, as far as can be seen, is in exactly the same position as it was at the early part of last week, when the tone was so dull and gloomy, and, therefore, whilst the little extra amount of buying, and the slightly advanced prices of the past day or two have been most appreciable, yet at the same time there is nothing new whereby any anticipations can be formed of an established improvement in the immediate future. The market, as we have often shown, is just as likely to go one way as the other. There is a vast amount of both "bull" and "bear" interest existing, and, therefore, from speculative influences prices may tend either in one direction or the other, whichever party proves themselves to possess most strength; and as regards legitimate influences, supply and demand keep much about on a parity, and are, therefore, just now unlikely to materially influence the market in either direction.

SPELTER.—The market remains dull at 14s. 10s. to 14s. 15s. for ordinaries, and 15s. for specials.

LEAD.—Business has been done in Spanish at 11s. 11s. 3d. and 11s. 12s. 6d., the latter remaining the price, while English is quoted at 12s. per ton.

STEEL.—The market is depressed, the demand inactive, and prices easy.

TIN-PLATES.—There is very little doing, and prices all round remain steady.

QUICKSILVER.—has been in good demand all the week, and closes very firm at 5s. 2s. 6d.

The settlement of the usual fortnightly account commenced on Tuesday, and has occupied the chief attention of the dealers in the MINING SHARE MARKET this week. General business has been slack, and there is very little alteration in prices, which are for the part merely nominal, and not always obtainable by those who may desire to sell. Transactions have taken place in Wheal Crebor, East Blue Hills, Bratsberg, Dolcoath, Killifreth, Great Laxey, and a few others.

TIN.—Since Jan. 7 the standard for ore has remained the same, but tin has been rather firmer than otherwise. In shares very little has been done. Carn Bras has been quiet, and leave off 3 to 3½; Cook's Kitchens have advanced to 11, 12; Dolcoath, 61 to 63; East Pools, 37 to 38. West Frances, 7 to 7½; the rise here on the great flat lode is up 25 fms., and the returns are 20 tons of tin per month. South Frances, 5½ to 6½; the lode in Pascoe's shaft is worth 35s. per fathom for 12 ft. long. East Blue Hills have been in fair demand, and leave off 4 to 4½; Killifreth, 4 to 4½; New Kitty, 1½ to 2½; North Blue Hills, 1s. to 2s.; South Condurrow, 9½ to 9¾; Tincroft, 4 to 4½; West Bassett, 2½ to 2½; West Kitty, 12½ to 13½; Wheal Agar, 11 to 12; Wheal Bassett, 3 to 3½; Wheal Grenville, 5½ to 5½; Wheal Kitty (St. Agnes), 4 to 4½; Wheal Uny, 4 to 4½; Wheal Pever, 1 to 1½; the prospect for copper seems to be improving, and the agents are very sanguine of success.

son's shaft preparations are being made to drive east and west on the course of the lode, where it is expected some profitable ground will be laid open as the levels are extended.

Devon Great United, $\frac{1}{2}$ to $\frac{1}{2}$; the lode in the 104 level, west of Willesford's shaft, is from 3 to 4 ft. wide, and yielding 4 tons of copper and muntic ores per fathom. There is no important change in other parts of the mine.

Drakewalls, $\frac{1}{2}$ to $\frac{1}{2}$; good progress is being made at the various points of operation, the levels and winzes being well pushed forward. It is expected that the rise in the back of the 90, west of engine-shaft, will be completed in about a month.

Ecton, $\frac{1}{2}$ to $\frac{1}{2}$; and reported to be firmer upon the rapid progress making in draining the Clayton Mine, and the very satisfactory indications that have been met with in all parts of it that have, so far, been unwatered. The manager reports that the pumping is going on steadily, without any hindrance or difficulty, and the amount of water is found to be very moderate. It is considered highly probable that in a few days the mine will be drained to the 30 fm. level, at which point it is intended to at once set a large force of men to work. Good results continue to attend the various exploratory operations in the shallow levels; during the past week the Ider Alley cross-course has been cut into, containing both copper and lead, and from its dip and bearing the manager thinks that it will soon form a junction with the famous Ecton vein, which at that point would be of great width, the main lode or vein probably measuring 25 to 30 ft. from wall to wall. It was from junctions of the main lode with cross-courses such as this that the immense returns made by Ecton were obtained, and great interest is consequently attached to the present discovery.

Kit Hill, $\frac{1}{2}$ to $\frac{1}{2}$; in the Tunnel level the distance driven during the past week was about 10 ft., the ground not being favourable for progress. The 88 east and west present a very promising appearance, the lode being 4 to 5 ft. wide, and yielding tin ore.

South Devon, $\frac{1}{2}$ to $\frac{1}{2}$; the manager in his report states that during the past week the lode in Martin's shaft has improved to 25 ft. per fathom, with every indication of further improvement. It is expected that in about a week's time another level will be opened, and driving will be commenced both east and west on the course of the lode, and where it is expected good ground will be laid open.

South Frances, $\frac{1}{2}$ to $\frac{1}{2}$; the lode in Pascoe's shaft is for 12 ft. long worth 35 per fathom. The four stopes in the back of the 226 west are worth together 72 per fathom. Good progress is being made in Daubuz shaft, and the three boring machines are working well.

California Gold, $\frac{1}{2}$ to $\frac{1}{2}$; the mill run this week was 496 tons; yield, 12000; smelting ore sales, 2000; total, 14000. The weekly report states that the 1500 level west is in a fine run of ore 6 ft. wide, the yield being fully 15 tons per fathom; and that the mill returns from this point are of an average of over 12 dwt. per ton. Operations are in progress for sinking the shaft to 1600 ft.

Kohinoor and Donaldson, $\frac{1}{2}$ to $\frac{1}{2}$; the directors received the following telegram from the manager at the mines on the 9th inst.:—“Mill cannot be supplied before 15th. Tramway automatic action must be assisted. Arr fix gear.”

Colorado United, $\frac{1}{2}$ to $\frac{1}{2}$; from the advices published this week it appears that the 13th level has now been driven 600 fathoms east of the shaft and that the lode at this point is 5 ft. wide, the ore being composed entirely of galena, with a little grey copper scattered through it, this being the class of ore most productive for silver in this mine. The ore body has now been fully proved by this drift of 600 fathoms. In the silver ore tunnel they are also in good ore, and driving on the Brown they have come into ore, and the workings on the Coin lode are also producing a fair quantity of mineral; so much so that the sales were 10 tons of cobbed ore, average value in Colorado \$250, notwithstanding the fact that the mill had been idle in consequence of the weather, but had just been started again; the milling ore on hand being 300 tons, which will produce from 40 to 50 tons of marketable ore of the value of from \$100 to \$150.

Ruby and Dunderberg, $\frac{1}{2}$ to $\frac{1}{2}$; the usual report this week is very short, owing to the Home Ticket Mine being closed on account of a dispute with the miners, which, however, only lasted for a short time, as work was commenced again about Jan. 30 on the new terms offered by the company. Since then shipments of ore have been much interfered with owing to deep snow, which has rendered the roads almost impassable. The usual work was going on at the Dunderberg and Lord Byron Mines.

In Lead Mine Shares there has been somewhat more doing, in consequence, probably, of the greater firmness of lead. The future of lead mines is considered to be favourable, inasmuch as during the long depression economy has been introduced wherever practicable, so that the shareholders will have the full benefit of any rise in the price of pigs. Vans are quoted 3 to $\frac{1}{2}$; the directors in their report, prepared for presentation at the meeting on Thursday next, regret their inability to declare a dividend. They explain that this result is altogether attributable to the continued fall in the price of lead and blende, which has had a disastrous effect on the finances of the company, the average price for the year having been for lead 94, 7s. 3*1/2*d., against 102, 13s. 5*1/2*d. in 1882; and for blende 27, 5s. 1*1/2*d., against 21, 9s. 5*1/2*d. in 1882. The directors trust that prices have now reached their lowest figure, the December sale realising only 8s. 9s. 3*1/2*d. per ton, and the January sale, 8s. 8s. 10d. per ton. It will be seen from the balance-sheet that the loss for the year amounts to 534, 16s. 11d. This is not really a loss on the workings, as it includes the settlement of an old rental account, as well as the purchase and erection of the rock-drilling machinery, which for want of capital has been delayed; together these items more than cover the amount mentioned.

It will be in the recollection of the shareholders that for some time past the western part of the mine at the bottom level has shown strong indications of developing a considerable course of ore. The favourable features are so marked that the manager recommends a speedy and special work for opening up this ground. He calculates that it will need a sum of 5000, to do this; and at this meeting the directors will call the attention of the shareholders to the necessity of raising this fresh capital, and the best mode of doing so can be then discussed and decided upon. The ordinary expenses and receipts nearly balance; the amount remaining at the credit of the reserve fund will soon be absorbed; and the directors are of opinion that, to ensure the future satisfactory working of the company, it is absolutely necessary that the sum indicated should be raised forthwith.

Roman Gravels, $\frac{1}{2}$ to $\frac{1}{2}$; on Thursday last 250 tons of lead ore were sold, and realised 1767*1/2*. The 110 south is in a lode 3*1/2* ft. wide, worth 4*1/2* tons lead ore per fathom, and the 80 south is worth 4 tons per fathom.

Tankerville, $\frac{1}{2}$ to $\frac{1}{2}$; a sale of 30 tons of lead ore and 40 tons blende took place on Thursday last and realised 363*1/2*. At the Pennerley Mine in the 93 west the lode in the winze is 7 ft. wide, and worth 3 tons lead ore per fathom, the two stopes in the back being worth together 4 tons per fathom. The returns both from the Bog and Tankerville portion of the mines are about the same.

Leadhills, $\frac{1}{2}$ to $\frac{1}{2}$; the various points of operation are about the same as at last report, and the mine is looking well.

At the Stock and Share Auction and Advance Company's sale on Thursday, in Lombard-street, City, the prices obtained, among others, were:—London Road Cars, 10*1/2* shares, 50s. to 52s. 6d.; Grosvenor Gallery Library, 5*1/2* shares, 35s.; Grange Trust (Canada), 50*1/2* debentures, 5*1/2* 10s.; Tregontrees and Old Polgoon, 1, 1*1/2*; Hotel Bristol, 100*1/2*, debentures, 80 per cent.; Nouveau Monde, 4s. 9d. Other miscellaneous securities fetched fair prices.

Messrs. C. de Murrieta and Co. notify that the dividend due March 1 on the Argentine Government Six per Cent. Public Works Loan, 1871, will be paid on and after that date by them.

GAS SHARES.—The principal business in these shares, according to this evening's report of Messrs. W. L. Webb and Co., of the Stock Exchange and Finch-lane, has been:—Babia 10 per cent. Preference, 26*1/2* to 26*1/2*; British, 40*1/2* to 41*1/2*; Buenos Ayres New (Limited), 10*1/2* to 10*1/2*; Cagliari Gas and Water (Limited), 23*1/2*; Commercial Consolidated, 24*1/2* to 24*1/2*; Continental Union (Limited) Original, 33*1/2* to 33*1/2*; ditto, ditto, New, 1889 and 1872, 23*1/2*; ditto, 7 per cent. Preference, 28*1/2*; European (Limited), 19*1/2* to 19*1/2*; Gas Light and Coke, A, Ordinary, 20*1/2* to 20*1/2*; ditto, D, 10 per cent. Preference, 22*1/2*; ditto, F, 5 per cent. Preference, 10*1/2*; ditto, H, 7 per cent. Maximum, 143*1/2* to 144*1/2*; ditto, J, 10 per cent. Preference, 22*1/2*; ditto, 4*1/2* per cent. Debenture stock, 11*1/2*; ditto, Monte Video, 15*1/2* to 16*1/2*; Oriental (Limited), 6*1/2* to 7*1/2*; Rio de Janeiro (Limited), 2*1/2*; South Metropolitan, 1*1/2*; ditto, B, 21*1/2* to 22*1/2*; ditto, Perpetual Debenture stock, 12*1/2* to 12*1/2*. Imperial Continental Gas firm, other stocks steady.

INSURANCE SHARES.—According to this evening's report of Messrs. W. L. Webb and Co., of the Stock Exchange and Finch-lane, been dealt in as follows:—Alliance British and Foreign, 3*1/2* to 3*1/2*; ditto Marine (Limited), 2*1/2*; City of London Marine Insurance Corporation (Limited), 5*1/2*; Commercial Union, 18*1/2* to 18*1/2*; County Fire, 15*1/2*; Employers' Liability Assurance Corporation (Limited), 2*1/2* to 2*1/2*; Equity and Law Life, 20 to 20*1/2*.

Fire Insurance Association (Limited), 11*1/2*; Guardian Fire and Life, 6*2/3*; Lancashire, 4*1/2*; Law Life, 11*1/2* to 11*1/2*; Liverpool, London, and Globe (1*1/2* Annuity), 2*1/2*; London, 5*1/2* to 5*1/2*; London and Provincial Marine (Limited), 4*1/2*; Marine (Limited), 27*1/2* to 27*1/2*; North British and Mercantile, 25*1/2* to 25*1/2*; Ocean Marine, 5*1/2* to 5*1/2*; Phoenix, 22*1/2* to 22*1/2*; Provident Life, 33*1/2*; Royal Exchange, 38*1/2* to 39*1/2*; Standard Fire Office (Limited), 5*1/2*; Universal Marine (Limited), 7*1/2*; Insurances idle. North British, Mercantile, and Thames and Mersey firm. Others steady, especially marine companies.

TRAMWAYS.—The closing prices of this evening, as quoted by Mr. Wm. Abbott, of Tokenhouse-yard, are given in tabular form in the last page of the Journal.

RAILWAY AND GENERAL MARKETS.—Referring to the course of business done to-day during official hours (11 to 3) Mr. Ferdinand R. Kirk Birch lane, writes:—**Opening:** Trunks keep very firm, the Ordinary being still 16*1/2* to 17, and the Thirds 40*1/2* to 41, which is a rise of 4 since last Friday. Hull and Barnsley are quoted 4*1/2* to 4*1/2*, 10*1/2* paid Great Easterns are 59 to 59*1/2*, and Brighton A 103*1/2* to 103*1/2*, 3*1/2* lower. Eries 27*1/2* to 28*1/2*, Readings 28*1/2* to 29*1/2*; Atlantic First Mortgage 46*1/2* to 46*1/2*. Mining shares are in better demand at higher quotations. Old Shepherds, 3*1/2* to 1*1/2*; East Wheal Rose, 3*1/2* to 3*1/2*; Home Mines Trust, 3*1/2* to 3*1/2*; Treaseyan, 3*1/2* to 3*1/2*; United Mexican, 9*1/2* to 10*1/2*; Wheal Creber, 2 to 2*1/2*; Bratberg, 1*1/2* to 1*1/2*; Devon Friendship, 1*1/2* to 2*1/2*; South Caradon, 3*1/2* to 4*1/2*.—**Closing:** Prices have rather given way, especially in Trunks, the Ordinary being 16*1/2* to 16*1/2*, while the Thirds have fallen to 39*1/2*, 39*1/2*. Unified stock is steady. Rio Tinto, 19*1/2* to 19*1/2*; Mason and Barry, 12*1/2* to 12*1/2*; Chon-tales, 3*1/2* to 4*1/2*; Victoria Gold, 3*1/2* to 3*1/2*.

GOAL AND SILVER.—Messrs. Pixley and Bell (Feb. 14) write: With the exception of 20,000*1/2*, sovereigns, taken from the Bank for South America, there has been but little demand for gold; and sovereigns and bars, to the value of 211,000*1/2*, have been sent in. The arrivals since our last have been 11,000*1/2* from Australia, 11,000*1/2* from West Indies, 46,000*1/2* from New Zealand, 110,000*1/2* from the Cape=178,000*1/2*. The Tamar has taken 45,200*1/2* to the Brazils, and the Peninsular and Oriental steamer 10,000*1/2* to Calcutta. An improvement in the value of silver bars has taken place, and the price may now be quoted as 51*1/2*d. per oz. standard; the demand has been for India. We have received since our last 40,000*1/2* from Chile, 71,000*1/2* from West Indies, 60,000*1/2* from New York=107,000*1/2*. The Peninsular and Oriental steamer has taken 113,000*1/2* to India. The quotations for bullion are:—Bar gold, fine, 7*1/2*, 9*1/2* per oz. standard; bar gold, containing 20 dwt. silver, 7*1/2*, 10*1/2* per oz. standard; Spanish doubleons, 7*1/2*, 9*1/2*, to 7*1/2*, 10*1/2* per oz.; South American doubleons, 7*1/2*, 9*1/2* per oz.; United States gold coin, 7*1/2*, 9*1/2* per oz. Bar silver, fine, 51*1/2*d. per oz. standard; bar silver, containing 5 grs. gold, 51*1/2*d. per oz. standard; cake silver, 55*1/2*d. per oz.; Mexican dollars, 49*1/2*d. per oz.; quicksilver, 5*1/2*, 5*1/2* per cent.

OSCAR GOLD MINE.—It is a very important fact in estimating the value of this property that some time ago there was broken at about 150 fms. south of the shaft, from which most of the rich auriferous stone has hitherto been obtained, a piece of clay-slate, which was assayed, and yielded 13 ozs. of gold per ton. It is believed by practical authorities who have visited the mine that a large quantity of the country rock, or strata through which the lode runs, will pay well. Machinery and stores can be landed close to the mine in summer, and there is a good harbour about 3 miles off, which is available in winter, and is always accessible. We are informed that the company have duly completed the acquisition of the property, and no time will be lost in erecting the necessary machinery.

BRATSBERG.—The monthly report received this week is again most satisfactory, the different points in operation being worth 46*1/2*. The water is drained from York's shaft, where the working on a rich lode will be resumed.

KIMBERLEY CENTRAL DIAMOND MINING COMPANY.—At the London meeting of the shareholders of this company held yesterday, it was stated that the Rose-Innes Company, with 12*1/2* claims, had been amalgamated with the Central Company, and that the South-East Company will shortly be amalgamated with it. The Cape Legislature has recently passed a new mining ordinance, the effect of which is to place this company on a better footing than it has hitherto occupied. A full report will appear in next week's Journal.

DEVON FRIENDSHIP.—They expect to cut Kent's main lode in the adit next month, and hope to find it as rich for copper as it was formerly east of the cross-cut.

TANKERVILLE.—At Bog there are a number of pitches at work, and this week there were sold from here 30 tons of lead for 20*1/2* 5s. and 40 tons of blends for 16*1/2*. At Tankerville the winze under the 232 is worth 1*1/2* ton, and the 232 east 1*1/2* to 2 tons per fathom. The stopes on the north lode are valued at 1*1/2* and 2 tons of lead and 1*1/2* ton of blends per fathom.

ST. JUST UNITED.—At the meeting on Feb. 8 the accounts showed a debit balance of 1281*1/2*, which was about 50*1/2* less than the profit on the last 16 weeks' work. The balance due from the late purser was 1898*1/2*, and the adventurers instead of proving against his estate accepted his shares in discharge of the debt. The mine is reported to be looking as well as it has for some time past.

WEST SETON.—At the meeting on Thursday the accounts showed a loss on the 16 weeks' working of 1976*1/2*, and a total debit balance of 823*1/2*. A call of 25*1/2* per share was made.

CORNISH MINING—OLD SHEPHERDS, AND THE NEIGHBOURING MINES.—It has more than once been remarked with regard to mining enterprise that adverse criticism is far better evidence of intrinsic value than the most glowing reports or the most complete silence, and in the case of the so-called East Wheal Rose group the speculation in the shares almost eclipsed consideration of what was being done at the mines, whence many supposed that the executive had been negligent of their duties, and adverse observations and unnecessary fears were the consequence. It is now ascertained, however, that the progress made has been rapid and satisfactory, and that the prospects are certainly better than they were when the concerns were started, and it is confidently asserted that in a very short time all doubts as to the value of the mines will be removed. At the present moment attention is chiefly directed to Old Shepherds, with reference to which some interesting details are given by Mr. Charles Baden, of St. Day. The comparisons which he makes are certainly striking, whilst his facts are indisputable.

MINING OFFICES, 1, ST. MICHAEL'S ALLEY, CORNHILL, LONDON, E.C.

ESTABLISHED UPWARDS OF FORTY YEARS.

MESSRS. WATSON BROTHERS, in referring to their public Circular in the *Mining Journal*, would also observe that they BUY and SELL SHARES at the nett market prices of the day in all well-established and respectable Mining Companies; also in English and Foreign Funds, Railway Stocks, &c.

M. R. MARLBOROUGH, STOCK AND SHARE DEALER, 29, BISHOPSGATE STREET, LONDON, E.C. (Established 31 Years)

Can SELL the following SHARES:—

50 Akankoo, fully paid.	60 Eberhardt.	15 Panuelillo.	35 Phoenix United.
50 Almada.	20 Hoover Hill.	100 Polberro.	75 South Devon United.
50 California.	100 Javal.	100 South Durdorow.	50 Last Chance.
50 Chontales.	50 Marke Valley.	33 Trevaunance.	50 Devon.
100 Devon			

the Weardale royalty recently held by Mr. W. B. Beaumont, M.P., but came into the hands of the Ecclesiastical Commissioners on his relinquishment of Weardale, and is now being worked by Messrs. J. W. Davison and Sons, of Consett. This industry has been in a very depressed state for some time past, and it is encouraging that the enterprising energy of Messrs. Davison have been successful, as by this discovery an entirely new mining field has been opened.

REPORT FROM CORNWALL.

Feb. 14.—There certainly is a distinct improvement in the situation since our last report, although it is founded upon little more than a general idea that matters cannot continue much longer in their present depressed state. The fact that the country is not raising sufficient metal to meet the demand for Cornish tin, though it has been questioned, is certainly one of the factors in producing this result, for it is seen that in the long run, under such conditions, prices cannot be kept down. It is felt that while statistics may be open to doubt, and while unfortunate experience has proved that favourable figures may co-exist with very unfavourable prices—the absence of stocks in the hands of Cornish smelters is a fact that is only susceptible of one interpretation, and that a reassuring one. Here it is the quality of our produce that tells. On the other hand, it seems to us that there is little to hope from the general aspect of trade, which shows no indication of such a speedy and substantial revival as we need. So far as individual mines are concerned, we have again, however, entered upon a period in which wise speculation and investment is likely to be well repaid. No doubt there will be some weeding out, the subjects of which will have to be avoided; but, on the other hand, there are improvements in progress that cannot fail to have very important results. But it must be borne in mind that this is not a time for starting or joining new ventures, so much as for sticking to and developing concerns already in existence.

The improvement which has already taken place at such mines as Tincroft and Carn Brea is, to our thinking, likely to prove no merely isolated gain, but to be largely representative. It will have just now the further advantage of encouraging the continued prosecution of several concerns that are on the very verge of abandonment, and that, indeed, can only be saved by prompt and decided action, and the action must be really decided. Financial difficulties must be settled at once, whatever the cost, or all efforts at economy in working will be practically thrown away.

The possible fate of Blue Hill sand Penhalls emphasises the need, too, of very decided action, on the part of mine adventurers generally, on the dues question. It is really not enough in these days to talk of partial remissions, and the only lord of these two sets that has risen to the level of the occasion, is Mr. Hancock at Blue Hills. Why the Duke of Buckingham should have made no sign is not within our province or power to explain; but it may be due to the ignorance of the peculiar needs of a locality, which is the great bane of absenteeism everywhere. The fate of these two promising mines is just now in the balance, and, hard as it may seem to sacrifice the results of so much outlay and labour, we believe the wisest course will be, if the lords will not throw their lot in with the adventurers and the working miners, to suspend. These are not times for half measures, and it would be mistaken kindness either to suggest or endorse them.

A very natural amount of dissatisfaction is being expressed with regard to the arrangements proposed for the acceleration of the up mail train on the West Cornwall and Cornwall railways. There is no doubt that the extreme west of the county and the distant outlying districts are at present very badly served, for the mail train leaves Penzance at 3:30 P.M., and in the places more distant from the rail barely gives opportunity for receipt and reply the same day. The delay of the train to a later hour, and the quickening of its speed are, therefore, highly essential, and have long been the occasion of fruitless agitation. Now, however, a change is to be made commencing on March 1 next, after long preparation, and it is to be made in such a manner, that so far as passengers are concerned it is quite possible that more people will be inconvenienced than gainers. For example, it will hardly be believed that two of the places at which it is proposed the mail train shall not stop in future are Camborne, with all its mining industry, and Par, the junction of the thwarts-country line between Fowey and Newquay, which serves the great china-clay district. It is difficult to understand why these places, of all others, should be left out in the cold, and there may yet be time for those who are personally interested—especially men of business resident in the Metropolis—to press this matter upon the Paddington board. If anything is to be done it is quite certain that no time is now to be lost. There are a good many changes now-a-days that have a very qualified advantage.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

Feb. 14.—At the ironworks in Derbyshire a fair amount of business continues to be done in both pig and manufactured iron, although there is considerable depression in the Cleveland and other leading centres of the raw iron trades. In Derbyshire, however, in nearly all cases the producers of pig-iron are also large consumers of it. The Staveley Company, having several furnaces in blast and obtaining ironstone from both Northamptonshire and Lincolnshire, uses a large quantity at their extensive foundries, noted for pipes, cylinders, pillars, and other heavy castings. At Clay Cross, in addition to the furnaces, there are extensive foundries, whilst at Sheepbridge there are also mills in addition to the foundry, and the same may be said with respect to the Butterley and Stanton Companies. In Sheffield and the district there has been little or no change in either the iron or steel trades. The lighter steel branches are still quiet, whilst the mills engaged on composite armour-plates continue busy, and are likely to be for many months to come. Most interest, however, appears to be taken in the progress of the coal trade in both Derbyshire and the West Riding after the long agitation which has been going on amongst the miners. Indeed, the coal trade is now in a more depressed state than it has been for a long time past, without much likelihood of it getting better. Its actual state will be fully seen from a return of the coal traffic by railway to London, especially as regards the Midland field—from Nottingham to Leeds.

There was a marked falling off in the quantity of coal sent to London by railway in January as compared with either of the two previous months. This was principally owing to the agitation on the part of the miners for an advance of wages towards the close of last year, causing merchants, dealers, large private consumers, as well as the gas and railway companies, to lay down exceptionally large stocks, in anticipation of a strike of the miners in Derbyshire, the West Riding, and Nottinghamshire. Consequently, when the miners abandoned all hopes of obtaining an advance of wages, and the trade became settled, the supplies in all directions were so heavy that the ordinary requirements were much less than would otherwise have been the case. This led to the men in several districts during January only working about four days a week, without much prospect of a change for the better for some months to come. The demand for house coal, in particular for the London market, declined to such an extent that the prices of the best qualities delivered are now 3s. per ton lower than they were in December, and it is not improbable that before long there will be a still further reduction. The present year, however, is likely to see some important changes in connection with the London coal trade, which will be of considerable benefit to colliery proprietors, many of whom are now selling without any profit, but allowing the merchants to fix the charges to consumers without considering what they pay to the mineowners. In fact, there is no connection between the pit prices and the prices the consumers are compelled to pay.

But the question of coalowners selling to the metropolitan public without the intervention of the merchants or middle-men is now being warmly taken up by the mineowners in the county of Durham, and it is expected that many of them will before long follow the example of the Marquis of Londonderry, and become their own sellers direct to the consumers. It will then become an actual necessity for the inland colliery owners sending by railway to London, especially for Nottingham, Derbyshire, and the West Riding to adopt a similar course, and it need scarcely be said they will be

greatly benefited in so doing. It would most certainly result in greatly increasing the quantity of railway-borne going to the Metropolis, which has advantages over that carried by sea. This was pointed out in the evidence given before a select committee by Mr. Cockerell, the principal merchant connected with the London coal trade. He stated that "in the transport by sea from 12 to 16 per cent. of small coal is made, whilst only about one-half of that quantity is made in the transport by railway." He further stated that "the cost of carriage from the ship to the cellar by the consumer was as much in good times as 6s. per ton, whilst from the railway to the cellars would be 4s. 6d. per ton"—but the cost of the latter at the present time is not more than about 3s. 6d. per ton. Such being the case there certainly does not appear any reason why the London consumers should even now pay from 2s. to 2s. 6d. per ton for their coal, whilst the pit price for the same is only about one-third of those amounts, or from 7s. to 8s. per ton.

This state of things will continue, no doubt, so long as the metropolitan merchants hold the monopoly they have done, but there is now every reason to believe that the colliery owners before long will be the principals in the sale of coal to the consumers, which will be greatly to the advantage of the latter, as they will only have to pay one profit, and that a moderate one, to the actual producer. There will also be a healthy and legitimate competition between the owners of coal mines sending by rail and sea, which will be to the benefit of the public, and no doubt to the advantage of the inland colliery proprietors and their workmen as well. The position of the various lines as regards the traffic during the last three months will be seen by the following figures showing the tonnage carried by each line:—

	Tons—Nov.	Tons—Dec.	Tons—Jan.
Midland	214,897	219,288	186,091
London and North-Western	158,483	143,779	123,969
Great Western	88,908	118,864	84,703
Great Northern	95,776	101,674	104,783
Great Eastern	71,870	87,274	62,994
Other lines	7,101	7,313	7,135
	637,025	678,202	569,675

There was no marked falling off in the tonnage sent in January from Clay Cross and other collieries in Derbyshire, whilst considerably less was sent from Newton and Co.'s, and some other collieries in the South Yorkshire district.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Feb. 14.—The demand in the Coal Trade continues irregular, and the reports brought on to 'Change this week by the South Staffordshire coal masters proper testified to the severity of competition from the Cannock Chase coalowners. These latter, whenever the call for domestic qualities is dull, as now, devote increased attention to supplies for the ironworks, and meet with considerable success. The out-turn being in excess of the demand at the present time, prices of fuel of all kinds continue unsatisfactory; and, certainly as to house coal, there does not appear to be much hope that prices will improve until the autumn. List prices for furnace and forge coal range from 10s. to 9s. per ton for the former, and in the Dudley district 8s. 6d. to 7s. 6d. for the latter. The fuel, which is here termed "forge coal" is, however, at this price amply good enough for mill purposes, and, indeed, is being used in the mills. Common forge coal is 7s. to 6s. 3d. per ton all over the district. Pig-iron is changing hands in limited lots, and those vendors are exceptional who are able to report, as did one agent upon 'Change this week, that his principals are sold forward for three months. These were the makers of a Derbyshire brand, for which 46s. 3d. was demanded. Northampton pigs were easy at 4s.; Staffordshire part-mines, 50s.; and cinder sorts, 40s. Orders in the manufactured iron trade are unevenly distributed, but the best steel makers keep busy. Marked bars remain at 8s. 2s. 6d. to 7s. 10s., and sheets (singles) 7s. 15s. upwards.

The 17th annual report of the South Staffordshire and East Worcestershire Institute of Mining Engineers states that the number of members now on the list is 179. The Council express satisfaction that through the instrumentality of the Institute a considerable sum was raised during last year, which tided the Mining Accident Fund over a difficulty; and that owing to the conferences with the authorities of Mason's College the splendid course of mining lectures were inaugurated. At the annual meeting of the Institute on Monday, at Dudley, the report was adopted, and Mr. A. Sopwith was elected President for the ensuing year. In his inaugural address Mr. Sopwith impressed upon the members that whilst new projects were worthy of discussion original papers on the trials and difficulties affecting mining engineering should not be neglected. Col. Beaumont, of Westminster, afterwards read a paper upon his rock-boring apparatus which did such good work in the Mersey Tunnel. It was decided to defer the discussion upon the paper.

The North Staffordshire Coal Trade continues unsatisfactory as the result of the lessened demand from the ironworks. Notwithstanding that production is less than formerly the supply of fuel upon the market keeps over-abundant. The demand for ironstone is in a decidedly better condition than that of coal, since the out-turn is very much smaller, and better prices are being realised. The pig trade remains quiet, and part-mines for which there is most demand are quoted at 45s. The finished ironworks are irregularly employed, and in the plate trade especially competition is severe. Ordinary plates are 7s. 12s. 6d. delivered Liverpool, and best ditto 8s. 10s. to 9s. Best "Crown" bars are 7s., and common are 6s. 10s. to 6s.

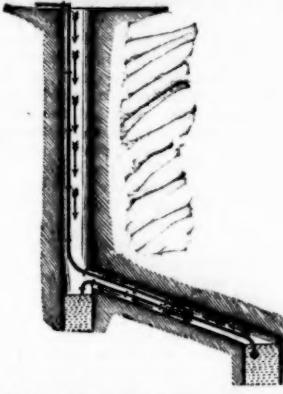
REPORT FROM LANCASHIRE.

Feb. 14.—The prospects of the Coal Trade in this district are of a very discouraging character. The winter season has brought none of the usual extra demand for house-fire coals, and requirements for general trade purposes have only been moderate, with a tendency to decrease rather than increase. The result has been that since the commencement of the year it is only in exceptional cases that pits have been kept on full time, and in the place of stores being cleared off they have been increased, whilst prices have been gradually giving way until round coal held in stock, which sellers are anxious to clear away, is to be bought at prices quite as low as those ruling during last summer. Some of the very best Arley coals still fetch 10s. per ton at the pit mouth, but for the lower classes of round coal it can scarcely be said that there is any really fixed price. Second qualities of Arley do not realise more than about 8s.; Pemberton four-feet coal, 7s. 6d. to 8s.; and common round coals, 6s. to 6s. 6d. per ton at the pit; engine fuel maintains a steady tone, but this is more because the present small quantity of round coal now being screened causes slack to be scarce than that there is any real activity in the demand. Burgy averages 4s. 6d. to 5s.; best slack, 3s. 9d. to 4s. 3d.; and good ordinary qualities about 3s. 3d. to 3s. 6d. per ton at the pit. Some of the pits in the Manchester district are being kept on full time, but in these cases a very considerable portion of the output is going into stock, and generally the average work done by the Lancashire collieries does not exceed four days a week.

In the Iron Trade there is a lull in the market following the tolerably heavy buying of last month, and all through business is quiet. Pig-iron makers, although tolerably well sold for the present, have no very favourable prospects before them. Finished iron makers, who have only been barely kept going since the commencement of the year, have no great weight of trade to look forward to; and in the engineering trade the activity which characterised last year's operations is rapidly disappearing, the work in hand, which is still keeping some of the leading firms busy, running out fast, with only a small weight of new business coming forward. The average prices at which business has been done during the past week are about 4s. 6d. to 4s. 10s., less 2s. for forge and foundry qualities of local and district brands of pig-iron delivered equal to Manchester, but the total weight of orders going out has not been large, the chief enquiries in the market being for long forward delivery, which makers at present hesitate to entertain. In finished iron only a hand-to-mouth trade is being done, at about 6s. per ton for good Lancashire

shire and North Staffordshire bars delivered into this district as the average basis of prices.

The application of water for mine purposes, such as the pumping of drainage from the mines, underground haulage, and winding, has of late been developed to a considerable extent, and it will be of interest to notice briefly this class of work, which is being supplied by Messrs. W. H. Bailey and Co., of Salford. Sir Hussey Vivian, M.P., was one of the first to introduce Messrs. Bailey's system into his mines in Sweden. He has since introduced it into South Wales, where he has a number of water motors for various purposes working with good effect. In this district one of the collieries owned by Messrs. Platt Brothers, of Oldham, has been recently supplied with a water motor, which develops 12-horse power for underground hauling, and by taking away the pump portion of the invention, and coupling up a connecting rod, these motors are utilised for blowing smiths' fires at the quarries of Penmanmawr. Messrs. Barclay have at present on hand a hydraulic motor winding-engine on Haag's system for a mine near Swansea, where the motor is to be used for sinking a shaft for raising both workmen and materials. There is a 220 ft. head of water in the rising main, and this head of water is being utilised to give a good 5-horse power by means of the motor, which is constructed to raise total load of 1000 lbs. The construction of these motors may be briefly described as follows:—The pumping-engines are of the direct double-acting horizontal cylinder type, and the annexed engraving represents one of these motor pumping-engines at work in a Welsh mine. The valve of the cut-off is arranged in a



simple manner, so that at the end of the stroke a small jet of water forces a flat valve across the ports, and this is effected by means of a small oscillating piston. The winding-engine motors are of the oscillating cylinder type, usually known as piston-engines, in contradistinction to those water-engines having buckets, known as turbines or sometimes rotary engines. The ports for the inlets and outlets are in trunnions of large diameter: the pressure of the water coming in from ports underneath the trunnions has a tendency to lift them from their faces, and they are kept in position by means of solid blocks at the back of the trunnions, which enables the pressure to be put on in proportion to the column of water. These blocks can be replaced after considerable wear, or they can be adjusted exactly to requirements.

TRADE OF THE TYNE AND WEAR.

Feb. 14.—The Coal Trade, on the whole, continues fair for the season. The demand for steam coal for shipment good. The experiment lately tried to introduce the coal at various coal stations appears to have proved fairly successful. Other branches of the coal trade are not quite so brisk. The house coal trade is in the worst position at present, and colliery owners only receive a poor price for this coal shipped to the Thames, while the merchants there still keep the price up to the consumers. There is still a good deal of agitation respecting this question; but whether it will result in any decided action being taken on the part of the coal owners we cannot state at present. A severe subsidence of land has occurred at Brandon, near Durham, in the heart of the coke-making district, by which some buildings have been destroyed. This has been caused by colliery workings—an 8 ft. seam of coal having been worked out there 30 years ago. There are a number of pit-falls in the fields adjoining. The Coke Trade has been rather dull of late, but some progress has been made in making contracts for the supply of this important article of manufacture over the present year; and it is also expected that there will be large exports of coke during the next month.

The iron and steel manufacturers on the West coast, at Maryport, Whitehaven, &c., are still endeavouring to get the Durham coke at a cheaper rate; no doubt they are much pressed in the present state of the trade, and the low price of iron and steel, to reduce the cost of manufacture as much as possible. They have, however, lately brought charges against the North-Eastern Railway Company, which are not correct; they appear, indeed, still to throw the whole blame of the high charges they had to pay for the conveyance of coke on this company; but the fact is that considerable reductions have been made lately by this company, and the charges they now make are fair, but the coke has to pass over three railway systems before reaching the works, and two of these companies have not reduced their charges to any great extent. Those ironmasters have also commented on the profits realised by the North-Eastern Railway Company, which are officially stated at upwards of 8 per cent. This statement is, however, misleading, as only a portion of the stock of this company is entitled to that amount of dividend. There is a number of different stocks in this great company, and the average dividend paid on the whole stock does not, we believe, exceed 5 per cent., therefore the ironmasters need not grudge that amount.

The Iron Trade continues quiet; until the furnaces are blown out there will not be much change in the value of pig-iron; some makers, however, wish to raise the price up to 40s. immediately. It is, however, possible at present to buy the iron at 37s. per ton for the next three months. The shipments of pig metal are improving. The competition for orders in the steel rail trade is very keen; local firms now quote 4s. 10s. The manufactured iron trade continues extremely dull, with falling prices. The iron shipbuilding trade continues to decline, and as ships are completed on the Tees the hands are discharged. A similar course to some extent is also pursued on the Tyne and Wear, and this will, no doubt, go on until a substantial reduction is made in the rate of wages. There is little change in the amount of iron in Messrs. Connal's stores. The shipments of pig-iron for the week amounted to 17,300 tons. The coal and coke trades are unchanged at Middlesbrough. It is expected that some important changes in the American import tariff will be introduced shortly, and if these alterations come up to present expectation they will have an important effect on various branches of trade in this locality. It is expected that the iron and steel trades, the chemical trade, and possibly the coal trade, will be benefited thereby.

The Chemical Trade continues to improve, the great advance in the value of the produce in this trade has placed these works on a much improved position. The annual report of the Newcastle Chemical Works Company has been presented, from which it appears that the nominal capital has been reduced from £10,000 to £24,000. The financial position of the company has been greatly improved. The manufacturing account shows a profit of £20,000. A mechanical decomposing furnace is now at work, and two others are in course of construction. It is to be regretted that the attempt made by this company to find salt at the mouth of the Tees has proved unsuccessful, 5480 ft. 15s. 3d. has been expended in boring, &c., but the salt bed has not been found. It is thus clearly shown that this bed does not extend so far as was expected, and the opinion is now held that the value of this bed will fall far short of what was anticipated. The first iron ship built at the new yard of Messrs. Macintire and Co., at Hebburn, has been launched, and three other

vessels are being constructed there. The iron shipbuilders on the Wear have offered to accept a reduction of 10 per cent. on their wages. The marine, locomotive, and general engineering trades here continue to be well employed. At Messrs. Hawks and Co., Gateshead, a considerable amount of iron bridge work is on hand. The other extensive iron and engine works in Gateshead, including the extensive erecting and repairing works of the North-Eastern Railway Company, are well employed at present.

The price of lead continues very low, and lead mining in West Durham continues much depressed in consequence. On the Allen some of the men employed by Mr. Beaumont have received notice that they will not be required two months hence. At Allendale Mills there is a large quantity of lead ready for sale. A company has been registered to acquire and work the Rowleyhead Mine, at Rowleyhead, in Hexhamshire.

TRADE IN SOUTH WALES.

Feb. 14.—The shipments of coal at Cardiff in the month of January were 620,130 tons foreign and 75,625 coastwise; Newport, 148,828, tons foreign and 69,705 coastwise; Swansea, 73,075 tons foreign, and 56,595 coastwise; Llanelli, 5500 tons foreign and 5732 coastwise. Last week Cardiff sent away 144,983 tons foreign, and 21,042 coastwise; Newport, 32,146 tons foreign, and 18,299 coastwise; Swansea, 18,138 tons foreign, and about 13,000 tons coastwise. The patent fuel trade is good, but the house coal trade is not active. Steam coal ranges from 10s. 3d. to 12s. 6d., according to quality. House coal may be had at from 10s. 3d. to 10s. 6d. The coal shipments at Penarth Dock last week exceeded the highest quantity ever shipped in one week since the dock has been opened by 2688 tons, the total quantity being 53,889 tons. The dredging operations for the removal of the earthwork between the dock and the extension has commenced, and a channel will shortly be made through, when vessels will be loaded at the new tips, and it is expected that the shipping capacity of the dock will be 70,000 tons per week. The housecoal trade around Bargoed and Deri continues very good, and the works are going on very regularly. Higher up the valley the steam coal trade is also very good, and, taking everything into consideration, matters are in a very satisfactory state; very friendly relations exist between the employers and employed, and times are better here than they have been for the past nine years. The coke trade still remains steady, and prices quiet. There are several rumours about new pits being sunk in these parts next spring. Sinking operations at the Elliot New Pit, near Cwmsynog, which is being sunk by the Powell Duffryn Steam Coal Company, are being pushed on vigorously, and will eventually give employment to a very large number of workmen. The above company have been in treaty about renting the houses at Pengam and Fleur-de-Lis, with a view of providing house accommodation for the workmen and their families. It is also intended to run cheap workmen's trains morning and evening to and from Fleur-de-Lis and New Tredegar.

The shipments of iron in the month of January at Cardiff amounted to 2308 tons; Newport, 7544; Swansea, 475; Cardiff sent away last week 1219 tons. The arrivals of iron ore are very large, Cardiff having received 10,280 tons from Bilbao, and 4479 from other places; Newport, 15,890 tons from Bilbao, and 7245 tons from other places; it is very low.

Although the tin-plate works are in full swing, very few new orders are accepted. Stocks now in this country only amount to 150,000 boxes, so that when the spring orders arrive we may expect to see a rapid movement upward in prices, and increased activity. IC cokes are only quoted at 15s. to 15s. 3d. Mr. P. W. Flowers' suggestion is a very commendable one for shipping the 4,000,000 boxes produced annually by the West Glamorganshire and Carmarthenshire works, and very shortly not only the Great Western line of steamships must add to their number, but the Liverpool steamships will also call for cargoes, seeing that Swansea has advanced the shipments of tin during the last four years from 68,182 boxes in 1880 up to 779,778 boxes in 1882.

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

Feb. 13.—The recent storm has played sad havoc with mine buildings erected in exposed situations. At the Braich-y-Oen Copper Mine, on the sides of Snowdon, it carried away the smiths' shop and dressing-floors, scattering the materials in all directions. At this mine, which is worked privately, there is a fine course of copper, lead, and blonde, of considerable width and length already proved.

The mines of the whole of this district which made a profit last year are few, consisting of Great Holway, Flintshire; Minera, Denbighshire; Roman Gravels, Salop; and Lisburne, Cardiganshire. At one important mine which recently sold lead ore at 7s. a ton, I am assured the actual cost, including everything amounted to 6s. 17s. 6d. In Shropshire perhaps the most important explorations are those carried on at the South Roman Gravels Mine, where a deep adit is being driven, which is intended to cut the great Roman lode, and a new shaft is being sunk some 300 yards from the southern end of the working on that lode in the Roman Gravels Mine.

There are signs of improvement in the slate trade, and the large stocks which had accumulated at some of the quarries are being rapidly cleared off. Through the lamented deaths of the Messrs. Hayward, father and son, which took place recently at Carvaron, the Cilgwyn Slate Quarry, Nantlle, is to be sold, as announced in the Journal. Next to the Penrhyn and Llanberis, the Cilgwyn has for many years been the largest and most successful quarry in Carnarvonshire. Several new and promising slate quarries are being developed in this county by local energy and means.

In the Coal Trade the men have wisely resolved not to press their demand for an increase of wages at present, but only to endeavour to strengthen their position by uniting themselves with the Lancashire Federation of Miners. The owners have intimated that the price of coal is still so low that it would be impossible to accede to any demand for an increase of wages. A case is proceeding in the Wrexham Magistrates' Court, in which Mr. Hall, Her Majesty's Inspector of Mines, prosecutes the Bersham Colliery Company for an infringement of the Mines Act in not providing sufficient ventilation. The case is exciting considerable interest among mining engineers, and considerable rebutting evidence has been given. The case has been twice adjourned. At the Hawarden Colliery, on Thursday, a miner was badly crushed by a fall of roof. In railway matters the Great Western dividend is 7s. per cent., as against 7s. last year. A slight decrease has taken place in the Cambrian traffic returns, resulting, doubtless, from the depression in mining industries. The Mid-Wales Company approve of a Bill, which is before Parliament, for providing communication between their line and Monmouth by means of an extension of the Golden Valley line in Herefordshire. The Whitchurch and Nantwich Junction has been abandoned. In their report the engineers of the Mersey Tunnel express the hope that the Tunnel will be ready for traffic by the end of the present year. Mr. Van Tromp, who for many years has been the district goods superintendent of the Great Western Railway, died at Shrewsbury, last week, at the age of 58. In the course of his duties Mr. Tromp had much to do with mine, quarry, and colliery owners, by all of whom he was much respected. The barge, or flatmen, of Runcorn, have struck work in consequence of a reduction made by the barge-owners of 4d. per ton of the amount paid as tonnage. The men are paid a small fixed wage, which is supplemented by tonnage thus:—A captain gets 15s. per week, which with tonnage is brought up to 2s. An ordinary man is paid 11s. per week, and his tonnage usually amounts to 16s. in addition. The ironworks keep employed, but there is no improvement in prices.

ARKANSAS AND TEXAS.—Under the title of Plain Facts about Arkansas and Texas, Messrs. Rand, McNaught, and Co., of Chicago, have just issued a pamphlet which will prove of paramount interest to intending emigrants. The comparative areas of improved, unimproved, cultivated, uncultivated, and timber-land, crops, population, commerce, religion, railroads, &c., of each State and the progress during a series of years are carefully shown in figures fully explained in the text, and the relative magnitude is graphically shown by the

introduction of beautifully executed coloured diagrams, from which the relation of one series of figures to another can be seen at a glance.

SPONTANEOUS COMBUSTION IN COLLIERIES—NO. I.

The interesting article of Mr. Duray on this subject has been translated and abstracted from the *Bulletin de la Société de l'Industrie Minérale*, by Mr. Alfred Bache, B.A., A.I.C.E., and published in the "Other Selected Papers" of the Institution of Civil Engineers, edited by Mr. James Forrest. It is stated that the primary causes of fires breaking out in collieries where the coal is contaminated with pyrites are believed by the author, who is engineer of the Doyet Collieries (it will be borne in mind that in many of the collieries of the Midland and other coal fields of France the seams are not only of great thickness, sometimes even more than 20 yards, but are also inclined at steep angles, sometimes nearly vertical), in the Department of Allier, France, to be the three following:—Oxidation of pyrites, friction from slippings, and warmth of air current. Experiments made by Mr. Fayol have shown that aboveground a heap of Commeny small coal, presenting to the air a surface of not more than about 1/2 square yard per cubic yard, will, if once it gets heated to a temperature that lies somewhere between 140° and 212° Fahr., go on heating more and more till at length it takes fire. Pyrites met with in coal seams is either amorphous or crystalline, and occurs in the shape of nodules, flakes, bunches, or veins, while sometimes it is so finely disseminated throughout the coal as to be invisible. In dry air and at low temperatures it does not oxidise; but its dissemination through coal or shale gives it a more porous character than appears to it by itself, and in almost all cases it oxidises in moist air, and becomes converted into sulphate of iron, the excess of sulphur being set free. The heat developed by the oxidation is further augmented, where there is sufficient moisture present, by the subsequent conversion of the sulphate of iron into hyposulphite, with liberation of sulphuric acid, which, when mixed with one quarter its weight of water, rises to the temperature of 220° Fahr. Various other chemical actions also conduce to the development of heat, while there is no absorption of heat by the formation of any gas during the oxidation of the pyrites. At Doyet Collieries the roof over the thick seam of coal is composed in some places of fine shaly sandstone containing pyrites, and near the outcrop, where cracks have occurred in the roof, the moisture from the surface and the air from the mine penetrating into them have caused the roof to get red hot, and to set fire sometimes to the timber props. A mere bunch of pyrites, however small, occurring either in the coal itself or in a shale parting, is quite sufficient to serve as a lucifer match for starting a conflagration. The sulphur liberated by decomposition of pyrites burns at 480° Fahr., and any sulphydine which may also be formed burns at about 660° Fahr., whilst the hydro-carbons of coal will not burn below 930° Fahr. at least. Hence pyrites, as furnishing the most inflammable products, is really what gives the start to a fire.

Where pillars of coal become cracked and crushed under the pressure of the roof, slippings occur, producing considerable friction, which develops corresponding heat, and as the surfaces sliding past each other are uneven, the friction and heat are concentrated upon the prominences in contact. The heat thus becomes sufficient not merely to accelerate the action of pyrites, but possibly to ignite coal seemingly free from pyrites, even anthracite hard to burn. In the open working at the outcrop at Doyet the coal has been set on fire by a sudden slip of the ground above. An air current that was warmed by uncondensed steam discharged from an underground engine at Doyet caused a little small coal, which had accumulated against some timbering, to get so hot that the timber took fire after the engine had been at work rather more than three months. In return air drifts the crushed coal in the roof is particularly liable to heat under the influence of the warm and moist current.

In seams free from pyrites the author believes oxidation of the hydro-carbons on exposure to air cannot develop heat enough to ignite the coal; and the only way in which he can account for spontaneous combustion in such coal is by the presence of dust or fine slack in the midst of any heaps that are found to be heating. Dust and fine slack he considers capable of exerting a condensing power upon the combustible gases that are ready to escape from bituminous or gaseous coal, and also upon the oxygen of the air, and the heat so developed may become sufficient to fire the gas, and thereby the coal. While, therefore, spontaneous combustion may occur in any colliery, whether the coal contains pyrites or not, it is more particularly in seams of caking coal containing pyrites that as the workings progress the pillars left standing grow hot rapidly under the combined action of oxidation of pyrites, pressure and subsidence of roof, and oxidation of hydro-carbons through condensing power of dust. It is the pyrites, however, which, wherever present in any appreciable quantity, plays the principal part in starting ignition, and thus constitutes the primary cause of fire; the other causes are then but secondary, although they may as far supplement the start thus given as to make a seam containing but little pyrites appear ready to fire than one containing much more.

The development of spontaneous combustion is considered by the author firstly in the case of masses of coal, such as pillars left in working. Really solid pillars never fire; those that do are always fissured with numerous cracks, and are more or less crushed. Outbreaks of fire are encouraged by the presence of any coal crushed small, which in its finely subdivided state promotes the chemical actions that induce heating. Fire first smoulders at the bottom of the innumerable cracks by which the pillars have become fissured under the crushing load they have to support; then the walls of the cracks get red hot and burn, sometimes bursting suddenly into flame where the previous heating has covered them with bituminous matter. The tarry smell thus occasioned often betrays the existence of fire before it has become visible; and so difficult is it to find its actual seat that often it is not discovered until it has crept outwards towards the air current at the mouth of the chinks, and has ignited the crushed coal behind the timbering of the roads, and then the timbering itself. The danger is augmented wherever there are timbered excavations overhead, and still more wherever a timbered drift has been pushed forwards under a mass of crushed coal overhead. Through such a mass air circulates easily, heat and moisture collect there, and fire breaks out quicker than where the overhead coal has been got out previously.

Wherever crushed coal can be harboured on or amongst the rubbish that is packed into the goaf, fire is sure sooner or later to break out. It begins at some distance in from the roads, and creeps out gradually towards them, igniting on the way any timber that may have been left buried in the gob-packing; the pungent wood-smoke gives immediate warning of the fire. Pillars purposely left unworked, either for maintaining a shaft or because the coal in them is not good enough, are also liable to take fire. The load bears unevenly around them, they crush and crack under it, and small crushed coal accumulates next to the gob-packing; the heavier the pressure the sooner do the pillars heat and fire. Similar circumstances occur where a nip in the seam stops the getting of coal. Where the goaf is not packed with rubbish, but the ground is left to fall in, there is certain to be fire if any crushed coal is left behind. The danger is liable to be enhanced by accumulation of explosive gas in the large cavities; as is the case also wherever cavities result from settlement of rubbish packed in the goaf.

As to collieries being set on fire from a lamp or an explosion of fire-damp, the author considers this can only occur where the mass so ignited has got very hot beforehand, and is ready to catch fire in a moment. An explosion, moreover, throws down a lot of coal that will easily take fire, besides shaking and splitting the pillars, and so rendering them more ready to ignite. Hard seams of caking coal, containing much gas and pyrites, are the most liable to spontaneous combustion. In very fiery seams the author has noticed that heating occurs generally in the dampest places, or along return air-ways when the air is warm and moist. Where a pillar of bad coal had stood without heating for seven years at the foot of an incline in a current of fresh air from the downcast shaft, an alteration in the ventilation exposed it to the return current of warm moist air, and it then got so hot in two months as to necessitate its speedy removal; by the time it could be worked it was already too hot to touch in some places.

The nature of the roof tells variably. In some collieries fire is found to break out more readily under a roof of tender shale than under one of thick hard sandstone. At Doyet, on the contrary, the thick sandstone roof, settling unevenly after the workings, leaves roof cavities, in which air circulates and encourages heating, while in places where a ceiling of shale separates the coal from the thick sandstone the shale falls, and no dangerous cavities are left. Coal or rubbish tipped in heaps aboveground from the pitmouth is liable to heat and fire by oxidation under the action of the air and wet, wherever the smaller stuff that collects at the top of the heap is combustible enough. The fire breaks out first a little below the top on the side most exposed to the wind, and spreads thence throughout the entire tip. It is sometimes started direct from the braziers burning at the pitmouth to light the landing of the cages; the tip then ignites first at the top, whence the fire spreads downwards and laterally.

P H O S P H O R I T E .

Phosphorite as a mineral was little understood until a demand arose for chemical manures when the value of this substance for the manufacture of super-phosphates made it manifest. As a mineral it may be described as a massive variety of apatite or native phosphate of lime, containing more fluorine than the crystallised varieties, analysis showing that apatite is composed of 55.75 lime and 44.25 phosphoric acid, hence known as phosphates of lime. Apatites are of various colours, very deceptive in appearance, and are often mistaken for other minerals, hence their name from the Greek word "apat," deceptive. The manufacture of super-phosphates has become a very great industry, especially in Germany, and the demand for phosphorite for this purpose very greatly exceeds the supply, and trade has lately received a still greater impetus from the fact that it is said to be the only manure that acts successfully in arresting the vine blight which has existed to such an extent for the last few years.

Large deposits of phosphorite have been found to exist in the neighbourhood of Limburg at the foot of the Sarschbach Mountains and already about 150 to 200 shafts have been sunk there. Several companies are working in the district, the most important of which is the Société Belge et Allemande Phosphates, who raise at present from 40 to 50 tons per diem, which finds a ready sale at from 5s. to 6s. per ton. We believe the whole of this is at present sent to Cologne for manipulation, but the Société contemplates the erection of extensive works so as to treat the material on the spot. Pit timber is abundant and cheap, and the undertaking is said to be most successful, yielding large profits to those interested.

The phosphorite in some places is massive, in others interspersed with clay, the ground being intersected by dykes of trap, but in all cases the mineral is found overlying a sub stratum of limestone; in the neighbourhood of Heckholzhausen near a large eruption of basalt 17 ft. from the surface was found some phosphorite boulders of about 40 lbs. weight each, which yielded on an analysis 84 per cent. of phosphoric acid; the average of phosphoric acid contained in the phosphorite in the entire district is given by Dr. Egger, and other German chemists to be as high as 31 per cent.

The neighbourhood has been prospected to a great extent, and large deposits found to exist at Steinbach, Hintermeilingen, Schupbach, Wirbelau, Offenheim, Heckholzhausen, Gaudenberg, and many other places which lie within a radius of about six English miles, and are attracting a large amount of attention, and the ground is rapidly rising in value. A railway for which a concession has already been obtained will pass through the district, at present the nearest station is at Rundell, five English miles distant from the village of Heckholzhausen, which is nearest to the present workings; the River Lahn offers, however, a ready means of transport to the Rhine, and phosphorite can now be transported by water to Rotterdam for 5s. a ton; of course in a new district like this it is hardly to be expected that the mining should be carried on in as scientific a manner as could be desired; the timbering is defective, and where difficulties are encountered the miners abandon the pits, and open fresh ones; this will be remedied in time, the phosphorite lies at shallow depths no expensive machinery is required, labour is cheap, and if the demand for super-phosphates continue (which cannot be doubted) those who have concessions are tolerably sure of a large return for their outlay.

Large deposits of iron and manganese are found in the district, and Krupp has works not far distant; black marble is worked in the mountains, and coal can be procured in Limburg at a low figure.

SOUTH STAFFORDSHIRE AND EAST WORCESTERSHIRE INSTITUTE OF MINING ENGINEERS.—The members may fairly be congratulated upon the prosperous condition which the report and accounts presented at the seventeenth annual meeting, held on Monday, exhibited. The number of members is increasing; there is a good balance in hand, and there are excellent assets. The result of the election for the current year showed:—Mr. A. Sopwith, President; Mr. John Brown, vice-President; Mr. R. Latham, treasurer; and Mr. Alex. Smith, hon. secretary.—Mr. Sopwith returned thanks for his election, and then delivered his inaugural address. After alluding to the good work done by the Institute, he suggested that whilst new projects and inventions were worthy of discussion, original papers on the trials and difficulties affecting mining engineering should not be neglected. Among these were ventilation, methods of working, lighting of collieries, surveying, descriptions of coal fields, underground haulage, &c. As to the mining lectures at Birmingham, he was glad to say that the Institute had always taken great interest in them, and continued to do so. Scientific training could now be received at the Mason College, and the result would be extremely beneficial to younger members of the profession.—A hearty vote of thanks was passed to the late President and the other retiring officers and Council members. Colonel Beaumont (Westminster) delivered an address on his rock-boring apparatus, which has worked with such success in the Channel and Mersey tunnels. Among the exhibits of the day were Mr. S. Woodall's "Windmill" portable railway; exhaust-steam injectors, by Mr. Saville, Manchester; Mr. Jonah Davies gave his experience; Mr. C. H. Treglown exhibited a model of Messrs. Tangye's improved direct-acting and centrifugal pumping-engines combined on one bed. The Marsaut patent lamps, improved dials, levels, anemometers, telephones, &c., by Messrs. J. Davis and Son, of Derby, were also exhibited.

CONDITIONAL ALLOTMENTS.—The condition that "no allotment shall be made unless the full amount asked for be subscribed" is one which affords great protection to investors, since it affords them the guarantee that if the money is unprofitably employed they will only have to bear the loss in proportion to the amount subscribed for; and the case of the White Cliff Lead Mining Company against a shareholder heard at the Birmingham County Court this week, proves that, where the number is made up by officers of the company such officers will be compelled to pay upon the shares like any other shareholders. The company in question was formed in 1876, and purchased some leasehold and freehold interest in certain mines situated at Llanrwst and Bettws-y-Coed. In 1878, in consequence of want of capital, the company were unable sufficiently to develop the mines, and they determined to raise fresh capital. The defendant applied for 10 of the 1000 new shares which it was decided to issue, and 740 out of the 1000 new shares were allotted to independent people; but the remaining 260 were allotted to the secretary of the company. The defendant paid 20*s.* on account of the calls in respect to the shares, and they now sought to compel him to pay the calls made on Feb. 7 and May 21. Arthur Cleveland Cox, formerly secretary to the company (which is now being wound up), said the money for the 260 shares, which were allotted to him had been paid by the directors out of their own pockets, and not out of the coffers of the company. He was subjected to a long cross-examination by Mr. Rowlands, who sought to show that the plaintiffs did not perform their part of the contract—that no allotment would be made until the number of applicants for shares was sufficient to take up the 1000. Mr. Cox stated that the 260 shares allotted to him were not mentioned in any balance-sheet issued until May, 1882. He believed they were

inserted in the balance-sheet for May, 1882, because the attention of the directors was drawn to the fact of their previous omission. He had paid for the shares in full. Witness could not say whether he had made a written application for the 260 shares; his impression was that he had not, but he was present at the meeting when they were allotted to him. He signed the contract, which every shareholder had to sign for registration at the Joint-Stock company's office. It was a contract rendered necessary by the shares being issued below par. He paid the balance due on the shares in March, 1883—12*l.* 15*s.* He got that money from Mr. Baker, one of the directors. He had no knowledge that that came out of the coffers of the company; he believed it was Mr. Baker's own money. The directors passed a resolution in January, 1881, rescinding the allotment of the 260 shares to him, but they afterwards found that they had no power to do so, and the resolution was recalled. At the close of the examination of the witness Mr. Rowlands addressed the Court for the defence; and his Honour gave a verdict for the plaintiffs for the amount claimed, holding that Mr. Cox, having signed the contract, made himself personally liable for the shares.

KING'S SAFETY HOOKS.—At the Derby Winter Assizes, just concluded, the case of King v. Oliver and Company was heard at nisi prius with a special jury. The plaintiff, Mr. John King, of Pintown, was the patentee in 1867 of an invention for a detaching hook used at colliery shafts to prevent the consequences of over-winding. The plaintiff desired to make his invention known among colliery proprietors, and he employed Mr. Stephen Humble, mining engineer, of Derby, to act as his agent. That patent had expired, and had nothing to do with the action; but in 1879 plaintiff patented another invention of a similar character. He entered into partnership with Mr. Humble, the latter paying 100*s.* to plaintiff, being half the expense incurred in obtaining the patent, and it was arranged that Humble was to have half the profits arising out of the sale of the invention. It was further stipulated that Humble should do his best to sell both the inventions, that he should pay a royalty of 1*l.* upon the patent still in force, and that, upon the expiration of the 1879 patent, in March, 1882, Humble should pay one-half the renewing fee. Upon Humble failing in any of these particular agreements, the agreement was to cease. Between 1878 and 1881 Humble paid plaintiff 310*l.* 12*s.* for royalties, but after the old patent had expired plaintiff was alleged to have discovered that Humble had pushed its sale in preference to the patent still continuing in force. In 1882 application was made to him to pay 2*l.*, being half of the expense of renewing the 1879 patent. Humble did not pay, and plaintiff had to pay the whole sum himself. Thereupon the plaintiff went to Messrs. Oliver and Company, the defendants in the present action, and to Messrs. Abel and Company, of Derby, the two firms who were making the hooks for Humble. He told them they must discontinue making the hooks, as the agreement between him and Humble was at an end. In January, 1883, Humble failed, and Mr. Belfield, accountant, of Derby, who was appointed trustee, believing that Humble's interest had not been extinguished, sold his supposed share in the patent for 25*l.* to Messrs. Oliver and Company, who had since continued to make and sell the hooks. Plaintiff's contention was, that the sale by Humble's trustees to defendants was void by the reason of the failure of Humble in his agreement with plaintiff.

Mr. Stephen Humble was called for the plaintiff, and he admitted that after 1881 he never attempted to push the 1879 hook.—In cross-examination witness said he never presented a book to Mr. Oliver showing that a balance had been struck with King. Since July King and witness had been working together again under a fresh agreement.—In re-examination witness was asked about his failure, and he replied that he had paid nearly the whole of his creditors in full.—Mr. Oliver, the managing director of Oliver and Co., William Cooper Furnaces, secretary to the defendants' company, and J. Macdonald, engineer for the company, gave evidence. The latter said he was acquainted with the inventions of 1879 and 1882. The patent of 1882 was an extension of the principle of the one of 1879.—This being the whole of the evidence for the defence, Mr. Lawrence submitted that an agreement transferring patent rights, as in this case, must be registered, and there was no proof of registration of the agreement of 1879 between King and Humble.—Counsel having again addressed the jury, the Judge summed up the evidence, and said this was a somewhat complicated case, but there were three points upon which counsel agreed should be submitted to the jury:—1. Whether a sum of 26*l.* 1*s.* found entered in the books of Humble and King was paid or allowed on account of the agreement mentioned.—2. Did Humble use his best endeavours in obtaining orders for hooks in accordance with the agreement of October, 1879.—3. Whether the invention of 1882 (that was the new patent) was an extension or modification of the patents of 1867 or 1879, or of any matter or detail contained or involved, or was it an independent new invention. His Lordship incidentally alluded to the difficulty of patent law, and said there was no more intricate question than what was for the Court and what for the jury to decide.—The jury found that the money (26*l.* 1*s.*) was not paid in fulfilment of the agreement; secondly, that Humble did not use his best endeavours; and, thirdly, that this was a new invention simply added to the old patent, and not an extension or modification. The Judge gave judgment for plaintiff with costs, but on the application of Mr. Mellor stayed execution until a motion for a rule can be heard.

HUBBARD'S NEWSPAPER AND BANK DIRECTORY.—In a work of the nature of a directory the general accuracy can only be judged of by the testing of particular cases and estimated by this standard the only conclusion that can be arrived at is that the work bearing the above title—London: Trübner and Co., Ludgate Hill—is inaccurate and misleading in every particular. Taking only the London newspapers there are almost innumerable inaccuracies even in the descriptions of the subjects to which the papers are devoted and as to the field of circulation. The date of establishment is, however, often correct. The stated circulation is in almost every instance absolutely and indisputably false; the falsehoods being of two classes which may be thus regarded. Where the figures are marked with a star they represent intentional misstatements for which the publisher of the Directory is not to be held responsible, whilst those without the star are errors through crass ignorance on the part of the publisher. It would be invidious to mention names of papers, whose circulation is overstated, but it may be affirmed that one on page 1645 with a starred circulation of 10,000 had once during its career a claim to about half that number, and might now be more accurately stated in hundreds than in thousands; the same remarks would apply with almost equal truth to starred, 8000, 20,000, 50,000 on page 1641. The *Mining Journal* circulation is stated at 1500, a mere fraction of the truth at any time since 1888 (unless Mr. Hubbard means the figure to represent the circulation in the New World); and the *Mining World* is stated at 1200, almost equally fractional; *Public Opinion* is set down at 6000, although for the last 20 years it has never been lower than 17000, and in many years recently has averaged many thousands above that number. Then *Engineer and Architectural*, whose circulation is not widely different from each other are put down, one at 2000 and the other starred 9000. These absurdities might be continued indefinitely, but the few mentioned will suffice to caution anyone against expecting accuracy in the volume and demonstrate its utter uselessness and non-reliability.

WEST KITTY.—The report from the manager, Capt. Vivian received at the offices of the company this week, represents the value of the points in operation to have increased considerably as compared with the previous report. This mine, writes a correspondent, as will be patent to any careful student of the weekly reports published in the *Mining Journal*, is steadily increasing in value. More over the tin is produced at the exceptionally low cost of 25*l.* per ton, and the property now appears also to be raising copper of a good quality in addition. Taking the above facts (I have my information from the best sources) into consideration, I respectfully submit that it is, to say the least, one of the anomalies of the present times that the shares should be standing at their present price.

WHEAL COATES.—It is cheering to find this long depressed property has made a move in the right direction, there being no call required at the general meeting on Tuesday next, and shares have sprung up in demand with a rise of about 5*s.* per share within the last few days, and probability of a rapid further advance. They should be considered cheap at 20*s.* per share for copper alone, having such a fine lode at the 80*s.* deepest point, and the expectation of quickly cutting the West Kitty flat tin lode, while plant is upon the property equal to all the requirements of a large mine, and could not have cost so small a sum as 10,000*l.*, is altogether satisfactory.

TREGEMBO MINING COMPANY.—At the meeting of this company held yesterday the accounts showed a debit balance of 490*l.* During the last few days good many of the shares have been relinquished, and under these circumstances it was thought better that the company should be wound-up voluntarily. Resolutions to this effect were accordingly passed.

POLBERRO, ST. AGNES.—The reports of Capts. Vivian, of West Kitty; Bennetts, of Penhalls; and Davey, of Penstruthal, have been received, and can be inspected at the offices of the company, Walbrook. The agents go very much into detail, and are agreed in recommending the sinking of Turnavore shaft to intersect the Wheal Pink lode, which has given in the adjoining mine 100,000*l.* profit. The shares are quoted 1*l.* to 1*4*. It is also stated that some levels in

Penhalls on this extraordinary course of ore are close up to Polberro boundary.

PRACTICAL MINING—VALUATION OF COPPER ORE, AND PAYMENT OF TRIBUTERS.—No. III.

But it is not alone for the calculation of the value of tributaries' ores in a market parcel that the system of working from the *real standard* is preferable to the common method. It frequently happens that miners who are not conveniently situated for selling their ores at the public ticketings arrange with a purchaser to buy all the ore they raise within a certain period—three months, six months, or twelve months as the case may be—at a price to be fixed according to the quotations for Tough Cake Copper published in the *Mining Journal* on the Saturday following the day of sale. In such cases much trouble and many disputes would be saved by the parties agreeing to consider a fixed amount below the market quotation for the metal as the *real standard*. This deduction would represent the smelter's profit, and might be 2*l.* or any other sum that might be determined upon. Thus, assuming the agreed deduction to be 5*l.*, and the market quotation for Tough Cake Copper on the Saturday following the sale, 78*l.* 10*s.*, the *real standard* would be 73*l.* 10*s.*, and if we deduct from this *real standard* the smelting costs, as shown in Table A, we can ascertain the price per ton of "copper in the ore" to be paid for ore of any given produce. The mode of procedure is of course identical with that which we have already described in referring to tributaries' ores mixed in a market parcel. As a guide for fixing the deduction to be made from the market quotation for Tough Cake Copper to find the *real standard* we may mention that, in cases which have come to our knowledge, the terms arranged between the miners and the purchasers would represent a deduction of from 10*s.* to 3*l.* 5*s.* Usually all the ores from one mine are purchased upon the same terms; but we know that in one instance caravans and pyramids were distinguished, and special terms made for each; this, however, would necessarily be a matter for arrangement between the parties: no general rule could be given. It will be observed that this is really returning to the system of purchasing copper ores adopted a century ago, at which time the average standard (which has now lost its meaning and value because, owing to the improvements in copper smelting, &c., ores of all produces can now be sent to market, and the returning charges vary with the produce) would have been identical with the *real standard*.

Before proceeding further we will explain the manner in which the value of each tributary's ore was obtained from the "fine copper," and the price per ton of "copper in the ore." In the first place we must know how to express shillings, pence, and farthings as the decimal fraction of 1*l.* sterling. This is extremely simple. The first decimal place represents florins and the third decimal place corresponds to farthings, but for greater accuracy we remember that .025 (instead of .024) is equal to sixpence; so that .125 would be the fraction for 1 florin and 1 sixpence, or for 2*s.* 6*d.* Again, .075 is equal to 2 florins and 3 sixpences—that is, 5*s.* 6*d.*, and so on. For amounts less than 6*d.* we add or subtract the number of farthings as may be most convenient; thus 6*s.* 7*d.* we should read 3 florins 1 sixpence and 7 farthings—that is, .325 plus .007 = .332. But 7*s.* 10*d.* we should read 8 florins—that is, .800 minus 7 farthings—that is, .007 = .793. By the converse process the decimal fraction of 1*l.* is expressed as shillings, pence, and farthings with equal rapidity; so that .834 reads 8 florins 1 sixpence and 9 farthings, or 16*s.* 8*d.* To the uninitiated it may appear a formidable task to calculate the value of 1-5518 tons of ore at 63*l.* 1*s.* 7*d.* or of .6686 tons at 62*l.* 5*s.* 9*d.*, yet knowing the rule and manipulating shillings, pence, and farthings as a decimal fraction of 1*l.* we encounter no difficulty whatever. We can, moreover, by dealing with the money decimal in conjunction with another table calculate the value of any given quantity of any material whatever at any given price. Thus—

1-5518	62-290
63-080	6686
1241440	373740
46554	498320
93108	373740
97-887,5440	373740
	41-647,0940

Here we simply multiply together the quantity of fine copper and the price, calculating the fractional parts of the pound in the price, as already explained. In the product, commencing from the right hand, we point off seven figures, because there are seven decimal places in the multiplicand and in the multiplier combined. Taking the first three decimals only (and applying the rule already given as to the last figure retained) we have 97-8887 and 41-647, respectively. Then again reconverting the fraction as directed for the value of these fractional parts we find the amounts to be 97*s.* 17*d.* 9*d.* and 41*s.* 12*d.* 11*d.* As the decimals in the product beyond the third place only represent minute fractions of one farthing it is unnecessary to take them into consideration. This process is embodied in the following rules:—

TO ASCERTAIN THE VALUE OF ANY QUANTITY OF COPPER OR OTHER MATERIALS (sold by the ton of 20 cwt.) AT ANY GIVEN PRICE.—*Rule:* Multiply the quantity by the price, taking Table C for the fractional parts of a ton, and calculating mentally the fractional part of a pound sterling.

Examples: 1.—What is the value of an iron casting which weighs 2 tons 3 cwt. 1 qr. at 5*l.* 8*s.* 4*d.* per ton? 2.—What is the value of 23 lbs. of ingot copper at 95*l.* 10*s.* per ton? 3.—What will 56 tons 7 cwt. 2 qrs. of coal cost at 8*s.* 5*d.* per ton?

To answer these questions we write 2-1625 (using Table C) for 2 tons 3 cwt. 1 qr., and 5-416 for 5*l.* 8*s.* 4*d.* Then multiplying 2-1625 by 5-416 we get 11-712*f.*, which with the assistance of Table G we find to be 11*s.* 17*d.* 3*d.*. In dealing with the second example we write .0104 for the 23 lbs. (using Table C), and 95-500 for the 95*l.* 10*s.* Then, 95-500 × .0104 = .993, which we see at a glance represents 19*s.* 10*d.* With regard to the third example we proceed in the same way, writing 56-3750 for the 56 tons 7 cwt. 2 qrs. and .421 for (that is, 4 florins and 1 sixpence minus 4 farthings) the 8*s.* 5*d.* Then, 56-3750 × .421 = 23-734*f.*, which we find to be 23*s.* 14*d.* 8*d.* We have not shown the details of the working, so that the several examples may be worked for practice.

TO ASCERTAIN THE VALUE OF ANY QUANTITY OF COPPER ORE (which is sold by the ton of 21 cwt.) AT ANY GIVEN PRICE.—*Rule:* Multiply the quantity by the price, taking Table B for the fractional parts of a ton, and calculating mentally the fractional parts of the pound sterling. **Examples:** 1.—Prove that 13 tons 9 cwt. 3 qrs. of copper ore at 4*s.* 6*d.* per ton is worth 56*l.* 4*s.* 3*d.* 2.—Ascertain whether 19*s.* 16*d.* 8*d.* is too much or too little to pay for 5 tons 2 cwt. 2 qrs. of ore at 3*s.* 17*d.* 6*d.* per ton.

TO ASCERTAIN THE VALUE OF ANY QUANTITY OF MATERIALS, WHICH ARE SOLD BY THE HUNDREDWEIGHT, AT ANY GIVEN PRICE.—*Rule:* Multiply the quantity by the price, using Table D for the fractional parts of a hundredweight, and Table G for the fractional parts of a pound sterling. When the price is very low we may (instead of calculating the decimal fraction of 1*l.*) use Table F for the fractional parts of a shilling, but remember that the product will then represent shillings and fractional parts of a shilling. When tons occur in the quantity they must be turned into hundredweights before the operation is commenced; thus, 7 tons 11 cwt. 2 qrs. 14 lbs. must be called 151 cwt. 2 qrs. 14 lbs., and written 151-6250. **Examples:** 1.—Ascertain whether 2 cwt. 1 qr. 17 lbs. of gunpowder can be bought for 6*l.* 16*s.* 8*d.* when the price is 56*l.* 6*d.* per hundredweight. 2.—Prove that 7 cwt. 2 qrs. 11 lbs. of soap at 1*s.* 14*d.* per hundredweight can be purchased for 13*l.* 1*s.* 4*d.* Ascertain whether 286*l.* 3*s.* 5*d.* is too much to pay for 5 tons 3 cwt. 3 qrs. 25 lbs. at 2*s.* 11*d.* 2*d.* per hundredweight.

The extensive application of the decimal fraction of 1*l.* sterling will have been seen from these examples; yet these are by no means the only instances in which it can be turned to account, for with its assistance we may calculate percentages, commission, brokerage, insurance, the cost of any number of articles at any given price, the value in pounds, shillings, and pence (no matter what may be the rate of exchange) of any amount of money expressed in the currency

of a foreign country and vice versa, and perform numerous other arithmetical operations for obtaining results indispensable in business in considerably less time than we can obtain the desired information from a ready reckoner; but to its use for these purposes we will refer hereafter.

TO CALCULATE THE NUMBER OF TONS OF 21 CWTS. CONTAINED IN ANY NUMBER OF TONS OF 20 CWTS.—*Rule 1:* Write down the quantity to be converted (using Table C for the fractional parts of a ton), remove the decimal point two places to the right, and divide by 105. In the result obtained the fractional parts must be converted into hundredweights, quarters, and pounds by Table B. *Rule 2:* Multiply the quantity (using Table C for the fractional parts of a ton) by .9524, and treat the result as before. *Remark:* The first rule is most simple, and saves most time. *Example:* How many tons of 21 cwt. are contained in 48 tons 5 cwt. 1 qr. imperial standard weight?

150) 4826-25 (45-9643 = 45 tons 20 cwt. 1 qr. 48-2625
626
1012
675
450
300
90

4343625
45-9652,0500

It will be seen that there is a slight difference in the result obtained by the two processes, but as the error is only 2 lbs. in nearly 50 imperial tons no great inconvenience will arise from the use of the second rule by those who prefer multiplication to division. **TO CALCULATE THE NUMBER OF TONS OF 20 CWTS. CONTAINED IN ANY NUMBER OF TONS OF 21 CWTS.**—*Rule:* Multiply the quantity to be converted (using Table B for the fractional parts of a ton) by 1-05 and, in the product, use Table C to convert the decimals into hundredweights, quarters, and pounds. *Example:* Prove that a copper ore is sold 21 cwt. to the ton 45 tons 20 cwt. 1 qr. of copper ore contains 48 tons 5 cwt. 1 qr. imperial weight.

THE GOLD FIELDS OF THE TRANSVAAL.

Although, as already stated, the pamphlet of Mr. THOMAS RICARD is a mere compilation, and adds nothing to what is already known to readers of the *Mining Journal*, it will be found well worth reading by those who have invested, or are inclined to invest, in Transvaal mines. By way of summary, he states that the Lydenburg mines present two descriptions of samples, one the "poor man's material," and the other the "capitalist's," that is to say, that while there are rich samples representing limited localities wrought by the diggers like pockets, vein junctions, &c., the bulk of material upon which large operations will have to rely for returns lie quite outside, or rather cannot fairly be estimated by such "spot samples." It seems, therefore, to us to them regretted that this, in the interest of the public, has not been explained in some of the published reports and prospectuses. It is equally matter for regret that of the large capital fixed upon for the new gold mining companies, the lion's share now going into the pockets of the promoters was not reserved for developing and equipping the mines.

**C. E. HALL, MEERSBROOK BANK.
SHEFFIELD.**

Makes a Speciality of the following Machinery suitable for Mines, Collieries, &c.:

THE "MULTIPLE ACTION" CRUSHER.

THE PATENT SECTIONAL CRUSHER in STEEL and Cast Iron for FOREIGN TRANSPORT.

THE EXCELSIOR ELEVATOR AND CREEPER.

THE ECLIPSE DRIVING CHAINS, instead of Gearing and Belting—POSITIVE DRIVING.

THE UNIVERSAL PULVERISER, for reducing Ores, Quartz, Lime, Phosphates, Cement, &c.

PATENT CORNISH CRUSHERS, with Hall's Patent Universal Tension Springs, instead of Levers and Weights.

Coal Washing and Dressing Machines for Coke Making.

IF THE SMALL COAL IS DRIED AS IT PASSES OFF THE MACHINE.

Wet Coal Grinding Machines, Coal and Slack Elevators, &c.

Write for Catalogues.

GREENWAY BREAKWATER.

DEEP-SEA HARBOURS AVAILABLE AT ALL TIMES OF TIDE, at a cost of from £7500 upwards, constructed everywhere in a few months.

For full particulars, address E. C. GREENWAY THOMAS, Esq., 376, Strand, London, W.C.

FORESHORE PROTECTION.

GREENWAY BREAKWATER.—Land protected from the destructive action of the waves at £1 the running yard. Most effective when the Sea is most violent.

For full particulars, address E. C. GREENWAY THOMAS, Esq., 376, Strand, London, W.C.

**SILVER MEDALS AWARDED AT CORNWALL POLYTECHNIC
1872 AND 1876.**

THE WELL-KNOWN PATENT SELF ACTING ORE DRESSING MACHINERY, as in operation at most of the large Mines in the Kingdom and Abroad, is now supplied solely by THE PATENTEE AND MANUFACTURER, Mr. GEORGE GREEN, Mining Engineer, AT GREATLY REDUCED PRICES also all descriptions of Mining Machinery, including

GOLD AND SILVER AMALGAMATING MACHINERY, complete Stamp Mills, Water Wheels, Steam Engines, &c.

ROLLER SHELLS FOR CRUSHING MILLS—a speciality

SPECIAL DESIGNS FOR EXPORT AND DIFFICULT TRANS

Prices and particulars on application to the Manufactory
ABERYSTWITH, SOUTH WALES

ALEXANDER SMITH, M.Inst.C.E., CONSULTING ENGINEER and VALUER of IRONWORKS, MINING, RAILWAY, ENGINEERING, and other PROPERTY, PLANT, and MACHINERY,
PRIORY STREET, DUDLEY

4, BURLINGTON CHAMBERS, NEW STREET, BIRMINGHAM

Mr. SMITH has been retained for nearly 20 years by some of the most prominent firms, and has conducted many of the largest valuations that have taken place in the kingdom.

Valuations for Stock Taking or any other purpose upon very reasonable terms

JAMES W. CHENHALL, Assoc. M.Inst.C.E., MORRISTON SWANSEA, SOUTH WALES, IS OPEN to UNDERTAKE the DESIGNING and BUILDING of METALLURGICAL or CHEMICAL WORKS, or their PLANT by CONTRACT or otherwise. Extensive practical experience in the Treatment of Copper, Lead, Silver, and Zinc.

BRENTON SYMONS, F.C.S., Assoc. Mem. Inst. C.E., CONSULTING MINING ENGINEER, TRURO. On his return from the Algerian Mining Districts early in November, will be prepared to undertake the INSPECTION—geologically or otherwise—of MINE-PROPERTIES at home or abroad.

Eighteen years' experience in the Management of Gold and Copper Mines (both by Wet and Dry Reduction) in Central America, Venezuela, Hungary, Turkey, &c.

J. A. JONES,

MINING ENGINEER,

GIJON (ASTURIAS), SPAIN.

Mines inspected and reported on. Assays and valuations effected. Has on hand offers of Mines of Copper, Calamine, Blende, Phosphate of Lime, Tin, Lead, Iron, Manganese, and Manganiferous Iron Ores.

MINING ENGINEER.

ALEX. DEL MAR.

Mining Engineer, late Director of the United States Bureau of Statistics, Mining Commissioner for the United States Monetary Commission, &c. 120, SUTTER STREET, SAN FRANCISCO.

Cable Address: "Delmar, San Francisco." Branch Offices: 61, Broadway, New York; and 77, Cornhill, London, E.C.

References: Messrs. Lazard Brothers and Co., 60, Old Broad-street, London. ALEX. KIRBY, Esq., 14, Great Winchester-street, London; and numerous others.

WM. BREDEMAYER,

MINING, CONSULTING, AND CIVIL ENGINEER, 48 E., SECOND SOUTH STREET, SALT LAKE CITY, UTAH,

United States Mineral Surveyor for Utah and Idaho, Notary Public, Geological Examinations, Reports on Mining Properties; Surveys Mines, Railroads, and Canals, and Superintends the Workings of the same. Prepares Estimates and Plans for Opening and Working Mines. Expert on Mining Questions before the Courts.

Address, P. O. Box, 1157, Salt Lake City, Utah.

THOMAS CORNISH, CONSULTING MINING ENGINEER. Mines Inspected and Reported on. Advice on Mining Management and Investment.

Twenty-five years' practical experience in Australia. Author of "Gold Mining: its Results and its Requirements"; "Our Gold Supply: its Effects on Finance, Trade, Commerce, and Industries"; "A Trip to Colorado," &c.

Address, care of MINING JOURNAL Office, 26, Fleet-street, London, E.C.

ESTABLISHED 1852.

MESSRS. CUNLIFFE, ENTWISLE, AND CO., FINANCIALISTS, MINING AND CONSULTING ENGINEERS, MINERAL ASSAYERS, STOCK AND SHARE BROKERS,

17, BLOOMSBURY, OXFORD STREET, AND 2, UPPER BROOK STREET, MANCHESTER.

Bankers: Manchester and Oldham Bank (Limited), Pall Mall, Manchester.

JOHN ROBERTSON, F.S.A., MINING AND CONSULTING ENGINEER, LAS VEGAS, NEW MEXICO.

Mines and Mining Claims carefully examined, Assays made of their Ores, and reliable Reports furnished.

Mining Properties bought and sold on commission. Has special facilities for inspecting properties in Mexico.

References by permission:—L. P. BROWNE, Esq., Las Vegas, New Mexico; Don F. A. MANZANARES, Las Vegas, New Mexico; His Excellency H. M. HOYT, Governor of Pennsylvania, Harrisburg, Pa.; H. S. PIERCE, Esq., Banker, Scranton, Pa.; Hon. JOHN HARDLEY, President Judge 45th Judicial District, Scranton, Pa.; N. H. SHAFER, Esq., Cashier Third National Bank, Scranton, Pa.; E. B. STUBBS, Esq., Attorney-at-Law, Scranton, Pa.; E. W. WESTON, Esq., General Agent Delaware and Hudson Canal Company, Providence, Pa.; Hon. Sir JOHN F. CLARKE, Baronet, Tullipanmore, Abergavenny, Scotland; R. L. CHANCE, Esq., Birmingham, England; FREDYVALE TAYLOR, Esq., of John Taylor and Son, 6, Queen's-race-place, London. JOSEPH ROBERTSON, Esq., 17, Tokenhouse-yard, London.

MONEY LENT, at EIGHT, NINE, and TEN PER CENT., on FIRST MORTGAGE of FREEHOLDS for IMPROVEMENTS and STOCKING, said freeholds in the Province of MANITOBA.

Address, HERBERT C. JONES, Solicitor, 20, Masonic Hall, Toronto.

In the Court of the Vice-Warden of the Stannaries.
Stannaries of Cornwall.

IN the MATTER of the COMPANIES ACT, 1862, and of the WEST DEVON GREAT CONSOLS MINE.

Notice is hereby given, that a PETITION for the WINDING-UP of the ABOVE-NAMED COMPANY by the Court was, on the 12th day of February, 1884, presented to the Vice-Warden of the Stannaries by Samuel Whitehall Mulloney, of Midday Chambers, Bishopsgate-street, in the City of London, Merchant, a Shareholder in the said company, and that the said Petition is directed to be heard before the Vice-Warden, at the Law Institution, Chancery-lane, London, on the 5th day of March, 1884, at Two o'clock in the afternoon.

Any Contributor or Creditor of the company may appear at the hearing and oppose the same, provided he has given at least two clear days' notice to the petitioner, his Solicitor, or agent, of his intention to do so, such notice to be forthwith forwarded to the Secretary of the Vice-Warden, R. M. PAUL, Esq.

Truro, Cornwall.

Every such Contributor or Creditor is entitled to a copy of the Petition and Affidavit, verifying the same from the Petitioner, or his Solicitor, or his Agents, within 24 hours after requiring the same, on payment of the regulated charge per folio.

Affidavits intended to be used at the hearing, in opposition to the Petition, must be filed at the Registrar's Office, in Truro, or before the 1st day of March next, and notice thereof must at the same time be given to the Petitioner, his Solicitor, or his Agents.

A. S. RAMSKILL, 7, Union-court, Old Broad-street, London.

(Solicitor of the Petitioner.)

CHILCOTT and SON, Solicitors, Truro, Cornwall.

(Agents of the said Solicitor.)

Dated Truro, February 14th, 1884.

IMPORTANT SALE OF VERY VALUABLE

MINE MACHINERY, PLANT, AND MATERIALS,

WEDNESDAY FEBRUARY 20TH, 1884, NOON,

AT WEST WHEAL TOLGUS, ILLOGAN, CORNWALL.

M R. W. T. DAVEY, Auctioneer, Redruth, has been favoured with instructions TO SELL BY PUBLIC AUCTION (in suitable Lots, at the above Mine, on Wednesday, February 20th, 1884, at Twelve o'clock precisely, the WHOLE of the first-class

MACHINERY, PLANT, AND MATERIALS THEREON.

COMPRISES

ONE 70 inch cylinder PUMPING ENGINE, stroke 10 ft. by 9, with first piece of main rod.

FIVE excellent 10 ton BOILERS, with fittings.

60 ft. SHEARS, with sheaves, bases, &c., shaft tackle and landing brace.

ONE new PORTABLE ENGINE, with two 9 in. cylinders, by Sykes, London.

ONE very powerful STEAM CAPSTAN.

There has been about 2600 recently spent to put this engine in first-class order.

FOUR good 10 ton BOILERS with fittings. Iron and other balance tubs.

ONE 60 ft. SHEARS and PULLEYS.

ONE PAIR of 12 in. cylinder horizontal WINDING ENGINE, with steam capstan and drawing gear, complete. This is a very high-class engine.

ONE nearly new 10 ton BOILER, fitted with Galloway tubes.

ONE nearly new 22 inch cylinder WINDING ENGINE, 6 feet stroke, equal beam, with crusher attached, complete.

ONE 6 ton BOILER, with fittings.

TWO DONKEY ENGINES, each of 7 in. cylinder.

AIR-COMPRESSOR, 20 inch by 18, 7 ton AIR-RECEIVER.

THREE BARRON ROCK DRILLS, two bars, one steam winch or ground lark engine.

300 fathoms of 3 and 1/2 in. iron air pipes; 50 fathoms 8 and 9 in. water pipes. 275 fathoms of pitwork of various sizes, from 8 to 20 in., including H and door-pieces and poles.

120 fathoms of very superior pitch pine rods, 12 and 14 inch.

210 fathoms of 1/2 in. galvanized wire rope, equal to new; 400 fathoms steel wire rope; two pairs of Colom's automatic jiggling machines, complete.

ONE 20 feet WATER-WHEEL, 10 in. breast.

Dry tube, wood sheds, also a considerable lot of old and new brass, new steel and iron, smiths' and miners' tools of every description, and a quantity of new and old timber and other materials in general use in mines.

For descriptive particulars see Posters. And any further information may be obtained from Capt. GILBERT, the Manager; or from the Auctioneer, 4, Station Hill, Redruth. Dated Jan. 29th, 1884.

RUBABON, DENBIGHSHIRE.

GARDDEN LODGE COLLIERY,

Situated about One Mile from Rubabon Station, on the Great Western Railway, to COLLIER PROPRIETORS, LIME MANUFACTURERS, CONTRACTORS, COAL, &c., MERCHANTS, AND OTHERS.

VERY IMPORTANT SALE OF FIXED AND MOBILE PLANT, PITCH PINE PIT HEADS, ENGINES, BOILERS, AND FITTINGS. TRAM, PERMANENT WAY, DOUBLE-HEADED and other RAILS, With a large quantity of first-class Fire-clay.

TUESDAY and WEDNESDAY, 26th and 27th February, 1884.

M R. WILLIAM WILLIAMS has been instructed TO SELL, BY AUCTION, at the above-named Colliery, on Tuesday and Wednesday, the 26th and 27th days of February, 1884, commencing each day at Eleven o'clock precisely.

FIXED AND MOBILE PLANT.

Consisting of double and single WINDING and other ENGINES, drums, flat wire ropes, steel rope conductors, &c., &c.

Also some 20,000 to 30,000 tons of well-tempered first-class FIRE-CLAY. To be offered in lots, of quantities to suit buyers.

Catalogues may be had at the leading Hotels at Oswestry, Wrexham, and Ruabon; and on application to Messrs. J. P. and J. T. SUTCLIFFE, Solicitors, Hebdon Bridge; Messrs. WALKER, SMITH, and WAY, Solicitors, Chester; Messrs. THOMAS, WADE, GUTHRIE, and CO., Chartered Accountants, 32, Brown-street, Manchester; or to the Auctioneer, at his offices, Salop-road, Oswestry.

ON SALE (CHEAP), TO CLEAR THE GROUND, GARSWOOD PARK AND LAFFAK-GARSWOOD COLLIERIES, ST. HELENS, LANCASHIRE.

THE ABOVE COLLIERIES, belonging to Messrs. David Bromilow and Co., being worked out, the WHOLE OF THE PLANT IS NOW OFFERED FOR SALE, BY PRIVATE TREATY, and consists of—

ONE SINGLE HORIZONTAL WINDING ENGINE, 30 in. cylinder, Cornish valves, 5 ft. 6 in. stroke, and 12 ft. drum for round ropes, and steam brake, by Robinson and Cook.

HORIZONTAL ENGINE, 24 in. cylinder, piston valve, 4 ft. stroke, 16 ft. fly-wheel, spur wheel for pumping, 3 to 1 pumping wheel, 14 ft. diameter, dice slide and L leg, by Coups Brothers.

HORIZONTAL ENGINE, 18 in. cylinder, slide valve 4 ft. stroke, 12 ft. fly-wheel, spur wheel 5 in. on face, single pumping crank 10 in. square, 4 ft. stroke, slide end, L leg.

HORIZONTAL ENGINE, 14 in. cylinder, slide valve 24 in. stroke, fly-wheel, spur wheel and drum.

ONE FAR HORIZONTAL WINDING ENGINES, 21 in. cylinders, 4 ft. stroke, slide valves, with 9 ft. drum for round ropes.

ONE BOILER, and several other SMALL ENGINES, LOCOMOTIVES, MACHINERY, LATHEs, PLANING and DRILLING MACHINES, TURNING and FITTING TOOLS, several large and small SAW BENCHES, THREE HUNDRED AND

NOBEL'S DYNAMITE

Alfred  *Nobel*



Manufactured and sold by
NOBEL'S EXPLOSIVES COMPANY, LIMITED
(FORMERLY THE BRITISH DYNAMITE COMPANY LIMITED).

Head Office: 149, West George Street, Glasgow.

EXPORT AGENTS: JAMES THORNE AND CO., 85, GRACECHURCH STREET, LONDON, E.C.
FACTORIES—ARDEER WORKS, STEVENSTON, AYRSHIRE.
WESTQUARTER WORKS, POLMONT STATION, STIRLINGSHIRE.
REDDING MOOR WORKS, POLMONT STATION, STIRLINGSHIRE.

TONITE, OR COTTON POWDER,

IS RECOMMENDED TO CONTRACTORS, MINERS, PIT SINKERS, QUARRYMEN, AND OTHERS, AS BEING
THE SAFEST, CHEAPEST, AND STRONGEST OF ALL EXPLOSIVES

TONITE is the most efficient and economical blasting agent ever invented, and is largely in demand. It does not contain any Nitro-glycerine, and is, therefore, exempt from the dangers of exudation, or of freezing and its attendant process of thawing.

The Company manufacture

PATENT DETONATORS

of a quality much superior to the foreign article. Also supply Safety Fuse and Electric Firing Appliances of best description.
The trade supplied on favourable terms.

ADDRESS—THE COTTON POWDER COMPANY (LIMITED)

23, QUEEN ANNE'S GATE, LONDON, S.W.

WORKS: FAVERSHAM, KENT.

Agents: DINEEN and Co., Leeds; DAVID BURNS, Haltwhistle; R. J. CUNNACK, Helston, Cornwall; J. and W. SMITH, Chapel-en-le-Frith; W. VEITCH, Jedburgh, N.B.; W. HARRISON, Barrow-in-Furness; W. J. PARRY, Bangor; HUNTER and FOTHERINGHAM, Glasgow.

RHENISH DYNAMITE COMPANY



OF THE GREATEST STRENGTH ALLOWED BY THE EXPLOSIVES ACT.

OFFICES:

1, Coleman Street Buildings, Moorgate Street, London, E.C.

LONDON AGENT.—E. KRAFTMEIER & CO., 5, GREAT WINCHESTER STREET BUILDINGS, LONDON, E.C.

DEUTSCHE SPRENGSTOFF ACT.-GES.

(GERMAN EXPLOSIVES COMPANY, LIMITED),

HAMBURG.



DYNAMITE

Of the HIGHEST DESCRIPTION, and of the maximum strength allowed by the British Explosives Act (75 per cent. Nitroglycerine).

CHAIRMAN — Dr C. E. BANDMANN, Late Partners of Messrs. A. Nobel and Co., of Hamburg,
GENERAL MANAGERS Mr. C. F. CARSTENS,

Mr. C. WICHMANN, Late Partner of Messrs. Bessler Waechter, and Co., London.

HEAD OFFICE: HAMBURG, PLAN. 9.

LONDON AGENT: MR. WM. BRODERSEN, 79, LEADENHALL STREET, E.C.
SHIPMENTS EFFECTED TO ALL PARTS. STOCK KEPT IN LONDON AND NUMEROUS COUNTRY MAGAZINES.

BRAUN AND BLOEM'S CELEBRATED DETONATORS—"EAGLE" BRAND.

TRADE



MARK.

No implements required for opening inner tin box, thereby avoiding any danger arising from opening same with tools, as generally used.

Sold by WM. BRODERSEN, 79, Leadenhall-street, London, E.C.
SOLE AGENT FOR THE UNITED KINGDOM AND THE COLONIES.

For Excellence
and Practical Success
of Engines.



Represented by
Model exhibited by
this Firm.

HARVEY AND CO. (LIMITED).

ENGINEERS AND GENERAL MERCHANTS
HAYLE, CORNWALL.

LONDON OFFICE.—186, GRESHAM HO SE, E.C.

MANUFACTURERS OF
PUMPING and other LAND ENGINES and MARINE STEAM ENGINES
of the largest and most approved kinds in use, SUGAR MACHINERY,
MILLWORK, MINING MACHINERY, and MACHINERY IN GENERAL.

SHIPBUILDERS IN WOOD AND IRON.

MANUFACTURERS OF
HUSBAND'S PATENT PNEUMATIC STAMPS

SECOND-HAND MINING MACHINERY FOR SALE,
In Good Condition, at Moderate Prices—viz.
PUMPING ENGINES; WINDING ENGINES; STAMPING ENGINES,
STEAM CAPSTANS; ORE CRUSHERS; BOILERS and PITWORK of
various sizes and descriptions; and all kinds of MATERIALS required for
MINING PURPOSES.

WATER JACKET E SMELTING FURNACES

PACIFIC IRON WORKS

RANKIN, BRAYTON, AND CO.

For Copper and Argentiferous Galena Ores.

GENERAL OFFICE AND WORKS,
San Francisco, Cal., U.S.A.

BRANCH WORKS,—CHICAGO, ILLINOIS, U.S.A.

The Pacific Water Jacket Smelters embrace many features that are entirely new and of great practical utility, which are secured by letters patent.

No other furnaces can compare with these for durability, and in capacity for continuous and interrupted work.

More than One Hundred of them are now running in the various mining districts of the United States, giving results never before obtained as regards continuous running, economy of fuel grade and quality of bullion produced.

These Smelters are shipped in a complete state, requiring no brick or stone work, thus saving great expense and loss of time in construction.

Complete smelting plants made to order, with all the improvements that experience has proved valuable in this class of machinery. Skilled and experienced smelters furnished when desired to examine mines and to superintend constructing and running of furnaces Estimates given upon application. Send for circular.

We refer to A. S. CHURCH, Esq., 118, LEADENHALL STREET, E.C., LONDON.

THE
BEST METAL FOR BUSHES,
BEARINGS,
SLIDE VALVES,

And other wearing parts of Machinery.
PUMPS, PLUNGERS,
CYLINDERS, &c.

PHOSPHOR BRONZE

WIRE, TUBES
SHEET, RODS
TOOLS &c.

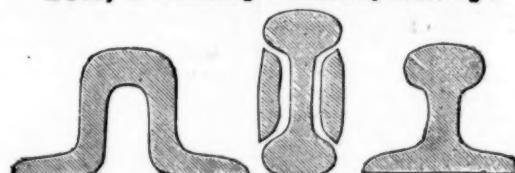
STEAM
FITTINGS

SOLE
MANUFACTURERS

UNDER PATENTS.

THE
PHOSPHOR BRONZE
COMPANY, LIMITED,
SUMNER STREET, SOUTHWARK
LONDON, S.E.

JOHN BEATSON & SON,
40h, St. Mary's Gate, Derby.



IRON AND STEEL RAILS, of all sections, from 10 to 86 lbs. per yard, new perfect, new slightly defective, or second-hand, with Fish-plates, Bolts and Nuts, Chairs, Spikes, and Points and Crossings to match, when required.

STEEL AND IRON WIRE ROPES, LOCOMOTIVE ENGINES, &c., &c.

BARS, PLATES, SHEETS, &c.

STEEL OF ALL KINDS. PIG IRON OF ALL KINDS

Delivers at all Railway Stations and Ports in Great Britain.

WILLIAM BENNETTS,
PATENT MINERS'

SAFETY FUSE
MANUFACTURER.



This manufacture embraces all the latest improvements for use in Blasting in Mines, Quarries, or for Submarine Purposes and is adapted for exploding Gunpowder, Dynamite, or any other Explosive; and is made suitable for exportation to any part of the world. Price Lists and Sample Cards on application.

All communications to be addressed—

ROSKEAR FUSE WORKS,
CAMBORNE CORNWALL.

CALIFORNIAN AND EUROPEAN AGENCY.
509, MONTGOMERY STREET, SAN FRANCISCO, CAL.
J. JACKSON, Manager

THE MINING SHARE LIST.

BRITISH DIVIDEND MINES.

Shares.	Paid.	Last wk.	Clos. pr.	Total divs.	Persh.	Last pd.
3200 Blue Hills, <i>s. c.</i> , St. Agnes	4 18 6.	M.	34 M.	0 0 0 0 0 0	2 0	May 1881
6000 Barn Brae, <i>c. t.</i> , Illogan	12 12 11.	3 1/2	3 1/2	52 11 8.	0 10	Nov. 1881
4000 Craigman Bach, <i>s. t.</i> , Cardigan	5 0 0.	—	—	0 0 0 0 0 0	—	Nov. 1882
10242 Devon Gt. Consols, <i>c. t.</i> , Tavistock	1 0 0.	4	3 1/2	118 0.	0 0 0 0 0 0	Dec. 1880
4700 Dolcoath, <i>c. t.</i> , Camborne	10 14 10.	62 1/2	59 51	36 6.	0 0 0 0 0 0	Dec. 1883
6400 East Pool, <i>c. t.</i> , Illogan	0 0 0.	—	35 37 1/2	31 19 6.	0 0 0 0 0 0	Dec. 1883
12000 Great Holway, <i>t.</i> , Finsleshire	5 0 0.	—	—	0 0 0 0 0 0	—	Sept. 1883
15000 Great Laxey, <i>t.</i> , Isle of Man	4 0 0.	10 1/2	11 1/2	21 18 0.	0 0 0 0 0 0	Oct. 1883
6400 Green Hurlt, <i>t.</i> , Durham	0 0 0.	—	7 1/2	7 1/2 4 1/2	0 0 0 0 0 0	Dec. 1882
9830 Gunnislake (Clitters), <i>t. c.</i>	2 2 2.	1 1/2	1 1/2	0 0 0 0 0 0	—	Sept. 1882
2800 Isle of Man, <i>t.</i> , Isle of Man	25 0 0.	—	—	83 5 0.	0 0 0 0 0 0	Sept. 1882
8000 Killifreth, <i>t.</i> , Chacewater	4 3 0.	—	55 55	0 0 0 0 0 0	2 0 0.	Nov. 1882
20000 Leadhills, <i>t.</i> , Lanarkshire	5 0 0.	2 1/2	2 1/2	1 5 6.	0 0 0 0 0 0	Sept. 1883
400 Leadburn, <i>t.</i> , Cardiganshire	15 15.	—	—	815 0 0.	0 0 0 0 0 0	June 1883
10000 Melinear, <i>c. t.</i> , Hayle	0 0 0.	—	2 1/2	2 4 0.	0 0 0 0 0 0	Jan. 1884
9000 Minera Mining Co., <i>t.</i> , Wrexham	5 0 0.	—	63 63	69 11 8.	0 0 0 0 0 0	Feb. 1884
20000 Mining Co. of Ireland, <i>c. t.</i> , c. P.	7 0 0.	—	—	24 0 0.	0 0 0 0 0 0	Jan. 1882
11829 North Hendre, <i>t.</i> , Wales	2 1 0.	—	—	0 0 0 0 0 0	—	Sept. 1882
8146 Ditto	—	—	—	0 0 0 0 0 0	—	Sept. 1882
2000 North Levant, <i>t. c.</i> , St. Just	13 6 0.	—	—	4 16 0.	0 0 0 0 0 0	Apr. 1883
4760 Penhalls, <i>t.</i> , St. Agnes	4 5 0.	—	5 1/2	3 17 0.	0 0 0 0 0 0	Jan. 1883
12000 Phoenix United, <i>c. t.</i> , Linlithgow	8 0 0.	—	5 1/2	17 7 6.	0 0 0 0 0 0	Apr. 1883
12000 Roman Gravel, <i>t.</i> , Salop	7 10 0.	5 5	5 5	9 11 0.	0 0 0 0 0 0	May 1883
6123 South Condurrow, <i>c. t.</i> , Camarne	7 5 7.	9 4	9 4	10 15 6.	0 0 0 0 0 0	Jan. 1884
8000 South Darren, <i>c. t.</i> , Cardigan	11 0 0.	—	—	0 0 0 0 0 0	—	Sept. 1882
6000 Tincroft, <i>c. t.</i> , Pwll, Illogan	13 12 0.	5	4 4	51 3 0.	0 0 0 0 0 0	Apr. 1882
15000 Van, <i>t.</i> , Llanidloes	4 5 0.	—	3 3	25 13 0.	0 0 0 0 0 0	Feb. 1883
15000 West Holway, <i>t.</i> , Finsleshire	1 0 0.	—	13 14	0 1 0.	0 0 0 0 0 0	Oct. 1881
6000 West Bassett, <i>c. t.</i> , Illogan	7 10 0.	3 1/2	2 1/2	28 3 8.	0 0 0 0 0 0	Apr. 1882
8000 West Katty, <i>t.</i> , St. Agnes	0 12 0.	—	12 1/2 12 1/2	1 19 0.	0 0 0 0 0 0	Nov. 1882
12000 Wheal Crox, <i>c. t.</i> , Tavistock	2 4 0.	—	1 1/2 2 1/2	1 1 3.	0 0 0 0 0 0	Nov. 1883
1024 Wheal Eliza Consols, <i>t.</i> , St. Austell	18 0 0.	—	—	59 0 0.	0 0 0 0 0 0	Nov. 1883
6000 Wheal Grenville, <i>t.</i> , Camborne	15 0 0.	—	5 1/2 5 1/2	1 15 0 6.	0 0 0 0 0 0	Dec. 1883
4285 Wheal Katty, <i>t.</i> , St. Agnes	5 12 0.	—	3 1/2 3 1/2	12 18 6.	0 0 0 0 0 0	Jan. 1881
3000 Wheal Pewtor, <i>t.</i> , Redruth	13 1 0.	2	1 1/2	8 13 6.	0 0 0 0 0 0	Mar. 1881

FOREIGN DIVIDEND MINES

Shares.	Paid.	Last wk.	Clos. pr.	Total divs.	Persh.	Last pd.
35500 Alamillos, <i>J.</i> , Spain	2 0 0.	—	13 1/2 13 1/2	2 12 2.	0 0 0 0 0 0	Sept. 1883
13000 Almada and Trito Cons., <i>t.</i>	1 0 0.	—	7 1/2 7 1/2	0 0 0 0 0 0	May 1876	
20000 Australian, <i>c. t.</i> , South Australia	7 7 5.	—	2 1/2 3	1 1/2 8.	0 0 0 0 0 0	Aug. 1882
15000 Birdseye Creek, <i>c.</i> , California	4 0 0.	1/2	1 1/2 1/2	1 5 0.	0 0 0 0 0 0	Jan. 1884
30000 Brasberg, <i>t.</i> , Norway	2 0 0.	—	2 1/2 2	0 0 0 0 0 0	Sept. 1882	
13000 California, <i>c. t.</i> , Colorado	1 0 0.	—	11 1/2 11 1/2	0 0 0 0 0 0	Dec. 1882	
20000 Capo Copper Mining "South Africa"	8 0 0.	—	45 45	55 7 6.	0 0 0 0 0 0	Dec. 1883
65000 Colorado United, <i>c. t.</i> , Colorado	5 0 0.	—	2 1/2 2 1/2	0 0 0 0 0 0	Dec. 1883	
50000 Copiapo, <i>c. t.</i> , Chile (44 shares)	3 10 0.	—	2 1/2 2 1/2	0 0 0 0 0 0	Dec. 1883	
70000 English & Australian, <i>c. t.</i> , S. Aust.	2 10 0.	—	—	3 2 3.	0 0 0 0 0 0	Apr. 1882
25000 Fortuna, <i>t.</i> , Spain	2 0 0.	—	3 1/2 3 1/2	3 8 3.	0 0 0 0 0 0	Sept. 1882
27000 Frontino & Boliviana, <i>c.</i> , New Gran.	2 0 0.	—	1 1/2 1 1/2	0 0 0 0 0 0	Dec. 1883	
20000 La Plata, <i>s.-t.</i> , Leadville	2 0 0.	—	—	0 0 0 0 0 0	Oct. 1882	
8500 Linares, <i>t.</i> , Spain	3 0 0.	—	3 1/2 3 1/2	19 7 4.	0 0 0 0 0 0	Sept. 1883
20000 Marbella Iron Ore, <i>s.</i> , Spain	10 0 0.	—	4 1/2 4 1/2	0 0 0 0 0 0	June 1882	
18518 Mason & Barry, <i>c.</i> , Portugal	10 0 0.	—	12 12 12	3 0 0 0 0 0	Oct. 1883	
80652 Panzeball, Land & Co., Venezuela	10 0 0.	—	5 5 5	1 1/2 9.	0 0 0 0 0 0	Sept. 1882
50000 Paracatu, <i>c. t.</i> , Brazil (in 6000 £1 pd.)	4 0 0.	—	—	0 0 0 0 0 0	Sept. 1882	
14900 Pontigual, <i>s.-t.</i> , France	20 0 0.	—	8 8 8	30 3 1.	0 0 0 0 0 0	Dec. 1883
100000 Port Phillip, <i>g.</i> , Clunes	1 0 0.	—	3 1/2 3 1/2	1 1 2.	0 0 0 0 0 0	Oct. 1881
50000 Rara Fortune, <i>t.</i> , Argentine Republic	1 0 0.	—	—	0 0 0 0 0 0	Sept. 1883	
54000 Richmond Consol., <i>s.</i> , Nevada	5 0 0.	—	4 1/2 4 1/2	14 15 6.	0 0 0 0 0 0	Aug. 1883
2452 Rio Tinto, <i>c. t.</i> , Mortgage Bds., Huelva	100 0.	—	102 100	5 per cent.	—	July 1880
325000 Ditto, shares	10 0 0.	—	13 1/2 13 1/2	3 0 0 0 0 0	Oct. 1883	
40000 Santa Barbara, <i>s.</i> , Brazil	0 10 0.	—	—	0 0 0 0 0 0	Sept. 1882	
120000 Scottish-Australian Mining Co., <i>t.</i>	1 0 0.	—	2 1/2 3	1 1/2 8.	0 0 0 0 0 0	Sept. 1883
80000 Ditto, New	0 10 0.	—	1 1/2 1 1/2	0 0 0 0 0 0	Sept. 1883	
225000 Sierra Buttes, <i>s.</i> , California	2 0 0.	—	1 1/2 1 1/2	2 6 0.	0 0 0 0 0 0	Oct. 1883
40625 Ditto, Plumas Eureka	2 0 0.	—	1 1/2 1 1/2	3 0 0 0 0 0	Oct. 1883	
253000 St. John del Rey ("£5 Stock and multiple dealt in")	75 85.	—	5 per cent.	—	—	June 1882
160000 Tambarachery, <i>s.</i> , Wynaad	1 0 0.	—	—	0 0 0 0 0 0	Aug. 1882	
180000 Tharsis, <i>s.</i> , su, Spain (18730 issued)	2 0 0.	—	6 1/2 7	2 18 6.	0 0 0 0 0 0	Nov. 1883
285000 Tolima, <i>s.-t.</i> , Colombia (A & Bahres)	5 0 0.	—	7 1/2 7 1/2	3 6 6.	0 0 0 0 0 0	Jan. 1884
200000 Victoria ("London"), <i>s.</i> , Australia	1 0 0.	—	—	0 0 0 0 0 0	Sept. 1882	
100000 Victorian (Nevada, U.S.) Deb. Bds.	1 0 0.	—	—	0 0 0 0 0 0	Sept. 1882	
150000 Western Andes, <i>s.</i> , Colombia	5 0 0.	—	5 1/2 5 1/2	4 1/2 9.	0 0 0 0 0 0	June 1883
85000 Cootacovil, <i>s.</i> , Wynaad	0 15 0.	—	—	0 0 0 0 0 0	Sept. 1882	
125000 Ghontales, <i>s.</i> , Nicar. ("105749 isms")	1 0 0.	—	3 1/2 3 1/2	0 0 0 0 0 0	Sept. 1882	
2000 Clear Creek, <i>s.</i> , Colorado	1 0 0.	—	—	0 0 0 0 0 0	Sept. 1882	
120000 Devla Central, <i>s.</i> , Wynaad	1 0 0.	—	—	0 0 0 0 0 0	Sept. 1882	
100000 Devla Moyer, <i>s.</i> , Wynaad	1 0 0.	—	3 1/2 3 1/2	0 0 0 0 0 0	Sept. 1882	
75000 Devla Provident, <i>s.</i> , Wynaad	0 10 0.	—	—	0 0 0 0 0 0	Sept. 1882	
140000 Dingley						